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**FIELD HYGIENE AND
SANITATION**

INITIAL DRAFT

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Field Hygiene And Sanitation

Contents

	Page
PREFACE	vi
Chapter 1 LEADERS PREVENTIVE MEDICINE	1-1
Lesson Learned During Operation Iraqi Freedom (OIF)	1-1
Section I - Message to the Commander	1-1
Commander's Responsibility	1-2
Preventive Medicine Services Provides the Commander	1-3
Section II - The Medical Threats and Principles of Preventive Medicine Measures	1-5
Medical Threats	1-5
Principles of Preventive Medicine Measures	1-5
Chapter 2 INDIVIDUAL PREVENTIVE MEDICINE MEASURES	2-1
Section I. - Heat Injuries	2-1
How Service Members Sustain Heat Injury	2-1
Different Types of Heat Injuries	2-2
Heat Injuries Can be Prevented	2-6
Preventive Tips to Help Service Members Avoid Heat Injury	2-6

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	Page
Signs and Symptoms of Heat Exhaustion.....	2-7
Additional Risk Factors	2-7
Drink Plenty of Water	2-7
Use Work/Rest Cycles	2-8
Eat All Meals to Replace Salts.....	2-8
Recognize The Risk of Mission-Oriented Protective Posture/Body/ Armor/Armored Vehicles.....	2-9
Modify Your Uniform.....	2-9
Section II. - Cold Injuries	2-9
Wear Uniform Properly	2-10
Keep Your Body Warm	2-10
Protect Your Feet	2-11
Protect Your Hands	2-11
Protect Your Face and Ears.....	2-12
Service Members Must Protect Their Eyes	2-12
Protect Your Buddy	2-12
Section III. - Arthropods and Other Animals of Medical Importance ..	2-13
Avoid Contact with Indigenous Human Population	2-13
Use the Department of Defense Insect/Arthropod Repellents.....	2-14
Individual Dynamic Absorption Kit	2-15
Keep Body and Uniform Clean.....	2-23
Follow Medical Advice	2-23
Protect Yourself at Night.....	2-23
Protect Yourself From Other Medically Important Arthropods and Animals	2-24
Domestic and Wild Animals or Birds.....	2-25
Section IV. - Poisonous Plants and Toxic Fruits	2-25
Section V. - Food-/Water-/Waste-borne Disease/Illness	2-25
Section VI. - Personal Hygiene and Physical and Mental Fitness	2-29
Section VII. – Hazardous Noise	2-31
Protect Yourself and Your Mission from Noise	2-31
Section VIII. - Toxic Industrial Chemicals/Materials	2-36
Chapter 3 LEADER'S PREVENTIVE MEDICINE MEASURES	3-1
Section I. - Heat Injuries	3-1
Leaders Plan For the Heat.....	3-1
Obtain and Use Heat Condition Information.....	3-2

Use of the Wet Bulb Temperature Index In the Control of Physical
Activity.....3-5
Enforce Individual Preventive Medicine Measures3-8
Modify Wear of The Uniform.....3-10
Identify Special Considerations3-11
Section II. - Cold Injuries3-13
Plan for The Cold.....3-13
Determine and Use Windchill Factor3-14
Identify Special Considerations3-15
Enforce Individual Preventive Medicine Measures3-16
Section III. - Arthropods and Other Animals of Medical Importance..3-16
Plan for The Arthropod, Rodent, and Other Animal Threat3-16
Enforce Individual Preventive Medicine Measures3-17
Minimize Exposure to Arthropod, Rodent, and Animal Threat3-17
Section IV. - Poisonous Plants and Toxic Fruits3-18
Obtain Information On Poisonous Plants and Toxic Fruit That
Could Be a Threat......3-18
Section V. - Food-/Water-/Waste-Borne Disease/Illness3-18
Plan for Safe Water.....3-18
Plan for Safe Food.....3-18
Plan for Construction and Maintenance of Field Sanitation
Devices3-19
Section VI.—Personal Hygiene and Physical and Mental Fitness3-19
Keep Your Unit Physically Fit3-19
Plan For Personal Hygiene.....3-20
Enforce Sleep Discipline.....3-20
Enforce Preventive Medicine Measures For the Effects of
Sleep Loss.....3-21
Ensure Welfare, Safety, and Health of Unit.....3-21
Reduce Uncertainty By Keeping Everyone Informed.....3-21
Promote Cohesion Within the Unit.....3-21
Impart Unit Pride.....3-21
Section VII.—Noise.....3-22
Plan For Noise.....3-22
Enforce Individual Protective Measures.....3-22
Protect Mission3-22
Section VIII. - Toxic Industrial Chemicals/Materials.....3-23
Plan For Chemicals.....3-23

Enforce Individual Preventive Medicine Measures	3-23
Chapter 4 UNIT FIELD SANITATION TEAM.....	4-1
Section I.-The Field Sanitation Concept	4-1
Field Sanitation Team Concept	4-1
Scope of Field Sanitation Team Operations	4-2
Field Sanitation Team Tasks.....	4-2
Selection of Personnel.....	4-3
Section II.-Training The Field Sanitation Team	4-3
Training	4-3
A Standard Unit Field Sanitation Team Equipment Set List.....	4-4
How to Make Your Field Sanitation Team the Best in the Command ..	4-6
Appendix A. UNIT-LEVEL FIELD SANITATION TEAM TASKS.....	A-1
Section I.—Basic Tasks	A-1
Task 1: Control Biting Insects Using A 1-Gallon Compressed	
Air Sprayer.....	A-1
Task 2: Control Domestic Rodents.....	A-6
Task 3: Prevent Injuries Due to Venomous Snakebite.....	A-7
Task 4: Inspect Unit Food Service Operations.....	A-7
Task 5: Inspect Water Containers	A-9
Task 6: Check Unit Water Supply for Chlorine Residual.....	A-11
Task 7: Chlorinate Water Supplies.....	A-12
Task 8: Set Up, Construct, and Maintain Field Waste Disposal	
Devices	A-13
Section II.—Disposal of Solid Refuse.....	A-27
Appendix B. PREVENTIVE MEDICINE SITE SURVEY CHECKLIST	B-1
Appendix C. PREVENTIVE MEDICINE BASE CAMP ASSESSMENT	
CHECKLIST.....	C-1
Section I.—Established Base Camp Assessment Checklist.....	C-1
Section II.—Preventive Medicine Pre-deployment Base Camp	
Assessment	C-8
Section III.—Preventive Medicine Environmental Condition	
Reports.....	C-12

	Page
Appendix D. SAMPLE UNIT FIELD SANITATION STANDING OPERATING PROCEDURES	D-1
GLOSSARY	Glossary-1
BIBLIOGRAPHY	Bibliography-1
INDEX	Index-1

Chapter 1

LEADERS PREVENTIVE MEDICINE

Thousands of Soldiers in Iraq became combat ineffective because of injury and illness. Most if not all of these problems could have been prevented or mitigated if soldiers had been trained, as they would fight. The loss of a soldier from the unit affects not only the individual soldier but also every other soldier who must take up their slack or train a new member of the team.

LESSON LEARNED DURING OPERATION IRAQI FREEDOM (OIF):

Units should maintain an adequate number of deployable soldiers that are trained in field sanitation to ensure a team are always available for deployments. The division leadership should conduct follow-up inspections to ensure shortages of field sanitation equipment and supplies are on-hand in the unit at all times, not just for deployments. Field sanitation should be incorporated into all field-training events.

During deployments field sanitation personnel and equipment should deploy with the unit. Added equipment such as materials for burn-out or pit latrines and hand washing stations must be taken on deployments to areas without pre-existing toilet facilities. At least some of these latrines should be available to accompany the first soldiers to arrive at a site.

SECTION I – MESSAGE TO THE COMMANDER

1-1. Throughout all of military history, DNBI have accounted for the vast majority of personnel losses of all military forces. For the US, historically, a staggering 80 percent of all US personnel have been lost to DNBI rather than injuries sustained through actual combat. The US military's attention to this historic dilemma has steadily improved on that largely avoidable statistic, but more work in this area needs to be done. In the final analysis, the fact remains that the on the ground commander is ultimately responsible for the health and fitness of his command throughout the continuum of all military operations.

1-2. Since the end of the cold war, to say that US military deployments have become more frequent would be a gross understatement. Not only have the deployments become more frequent, they are more diverse as well as

dangerous (for example: peacekeeping, humanitarian, drug interdiction, counter terrorism) than at any time in our nation's history. Not only must today's commanders be able to carry out their missions regardless of the alien environments that they encounter, they must be able to sustain themselves and their commands healthfully through it all.

- The potential medical threats that may be encountered during each of these deployments must be captured and brought to the forefront of each commander's preparations. His deployment preparation must include PMM that ensure the health of US service members in all instances, through all phases of the command's deployment.
- In response to dramatically changing strategic objectives (that include vastly diverse environmental and occupational situations that are faced by the "boots on the ground" service members) commanders are mandated to support the medical strategy for all US Armed Forces. The PVNTMED TTP for these varied deployments depend on the training that the service members receive during each phase of the deployment.

COMMANDER'S RESPONSIBILITY

1-3. The commander is responsible for the protection of the health of US forces while in garrison, during mobilization, predeployment, postdeployment and demobilization. Only he can make the command decisions concerning the health of his unit in consideration of the—

- Mission.
- Medical Threat.
- Condition of troops.

1-4. In addition to all of the other tasks he has to contend with, the commander must focus on the anticipation, prediction, identification, prevention, and control of communicable DNBI, illness, injuries and diseases due to exposure to occupational and environmental health (OEH) threats, combat stress responses, and other threats to the health and readiness of military personnel and military unit commanders to sustain the combat effectiveness of his command.

1-5. The Army Medical Department (AMEDD's) integrated approach to casualty prevention enables the commanders to promote and sustain a healthy and fit force. Commanders *can* and *must* reduce casualties stemming from DNBI, chemical, biological, radiological, and nuclear (CBRN) injuries, OEH hazards, and combat operational stress reactions (COSR). They can reduce DNBI by implementing effective PMM and by insisting on the training of the FLD SAN TM for their commands.

1-6. Successful implementation of PMM is global in scope. It encompasses not only traditional PVNTMED functions, but also those of Occupational

Medicine and Industrial Hygiene. Simply stated, service members who do not become casualties remain part of the fighting force. They do not require treatment, evacuation, or hospitalization. The prevention of DNBI frees constrained medical assets to support service members wounded in battle.

1-7. Preventive medicine services can provide essential information to commanders in maintaining and sustaining the health of the force in garrison and during mobilization, predeployment, deployment, redeployment, and demobilization.

Preventive Medicine Services Provides The Commander

1-8. The PVNTMED sections can provide a commander with current information on the:

- Medical information and intelligence data.
- Current medical threat assessments.
- Preventive medicine measures (individual and unit) to counter the medical threat.
- Medical surveillance (refer to FM 4-02.17).
- Occupational and environmental health surveillance (refer to FM 4-02.17).
- Field hygiene and sanitation guidance and training (refer to FM 4-02.17).
- Risk communication (refer to FM 4-02 and FM100-14).
- Public Health Services.

1-9. Preventive medicine is organized into five levels of support. These levels are based upon capability, not upon echelonment or location in a theater of operations (TO).

1-10. Theater operations are normally organized into four levels of support that extend rearward from Level I throughout the theater and then back to the sustaining base in the Continental US (CONUS) at Level V.

1-11. In the TO, PVNTMED support is tailored and leveled to enhance mission requirements, to counter the anticipated medical threats, and to provide PVNTMED support as far forward as the tactical situations permits within the health service support (HSS) Levels of Care System.

1-12. Preventive medicine resources are employed on an area support basis to provide the utmost benefit to the maximum number of personnel in the area of operations.

- At Level I HSS, there are no organic dedicated PVNTMED-trained personnel. Basic field hygiene and sanitation are the responsibility of the unit commander, unit leaders, and the individual service members. Unit appointed and well trained unit FLD SAN TM and

the strict enforcement of personnel hygiene and field sanitation practices are mandatory standards for operating procedures at this level. Medical personnel organic to these units (the trauma specialists [medic] and battalion aid station [BAS] personnel) can be incorporated to provide training for FLD SAN TM and individual service members as required. If PVNTMED subject matter expertise (SME) is required, the commander can request assistance from the next higher level of HSS.

- At Level II medical companies and those troops located at brigade, division, and corps levels have organic PVNTMED assets who provide PVNTMED support on an area support basis. Preventive medicine support at this level of HSS is providing guidance on basic field sanitation, field screening of water supplies, basic pest management, focal application of pesticide, limited medical and OEH surveillance, and unit FLD SAN TM training.
- At HSS Levels III and IV, PVNTMED support is provided by small mobile PVNTMED detachments. A PVNTMED detachment provides technical consultation support on PVNTMED issues throughout a theater. Further, the detachment provides specialized PVNTMED support in the areas of medical surveillance (MEDSURV) and OEH surveillance, health physics, medical entomology and pest management, environmental engineering, medical threat profile, and health hazard assessment. The detachment also provides field screening and presumptive identification of water samples, arthropods, and rodents and conducts dining facilities sanitation instructions. An additional capability is provided at Level IV by the current theater Army medical laboratory (TAML) (to be replaced by the area medical laboratory [AML]). Both the TAML and AML are field laboratories that provide rapid health-hazard identification and assessment within the area of operations.
 - The major differences between the two laboratories is that the AML will be a hospital-independent laboratory that will add sophistication and high-technology laboratory capability for investigative procedures that will allow it to be more complete in analysis of data for the evaluation of health hazard assessments of nuclear, biological, chemical and endemic disease, occupational and environmental health threats.
 - The current TAML does not contain that level of specialization. These operational health hazards include nuclear, biological, and Chemical (NBC) threat agents, endemic diseases, and other medical threats associated with OEH hazards.
- Level V HSS provides the sustaining base of medical research facilities and laboratories, the US Army Centers for Health Promotion and Preventive Medicine (USACHPPM), the Armed Forces Medical Intelligence Center (AFMIC), and other PVNTMED-related organizations. These organizations will require Secret Internet Protocol Router Network (SIPRNET) to gain complete access to their information Websites.
 - However, about 80 percent to 90 percent of the website

information is available through their sites without SIPRNET password clearance procedure on the Nonsecure Internet Protocol Router Network (NIPRNET). The NIPRNET is automatically loaded on each communication system deployed in theater. Additionally, within the sustaining base, the HSS system provides installation and regional resources and programs to maintain a healthy and fit force.

- Only commanders can make the command decisions concerning the health of their unit.

SECTION II – THE MEDICAL THREATS AND PRINCIPLES OF PREVENTIVE MEDICINE MEASURES

MEDICAL THREATS

1-13. The medical threats are traditionally evaluated for their potential impact on US forces and US military operations. Though important, but to a lesser extent, the identified medical threats are also assessed against their potential effect on the host nation (HN) and their people; as well as the supported allied elements, and known insurgent forces. Discovery of the medical threats whether to our own forces, or our allies, or even the HN and its people, is the motivating initiative that PVNTMED personnel work to attain and develop PPM for ongoing military operations. Medical threats encompasses the following:

- Heat.
- Cold.
- Arthropods and other animals.
- Food- and water-borne diseases.
- Toxic industrial chemicals/materials (TIM).
- Noise.
- Nonbattle injury.
- The unfit Service Member.

PRINCIPLES OF PREVENTIVE MEDICINE MEASURES

1-14. The principles of PMM are:

- The service members perform individual techniques of PMM.
- The chain of command plans for and enforces PMM.
- The FLD SAN TM train unit members in PMM and advise the commander and unit leaders on the implementation of needed unit-level PMM.

NOTE

Do not let your FLD SAN TM just be an Inspector General requirement. Make it an asset you can use. Your FLD SAN TM has a critical role and can assist you in protecting the health of the personnel in the unit.

WARNING

Failure to apply the principles of PMM can result in mission failure.

Chapter 2

INDIVIDUAL PREVENTIVE MEDICINE MEASURES

Leaders must remember and apply the principle that the most effective PMM they can apply is to visibly set the example in the use of the individual PMM that are discussed throughout this FM.

Recent deployments to Southeastern Europe, Central Asia, and Southwest Asia (SWA) have posed health hazards unfamiliar to a majority of US service members. The latest military operations in SWA (Iraq, Kuwait and Saudi Arabia) have been wrought with extraordinary occupational and environmental health hazards and challenges. Many, if not all of the occupational and environmental health hazards encountered in Kosovo and Afghanistan have had to be overcome in SWA as well.

In order for the US Forces to carry out its operational objectives not only have they had to contend with combative nature of these operations, they have had to contend with unmitigating extremes in the occupational and environmental hazards and all that they entail as well. This chapter will discuss those environmental hazards and how, as individual service members, they can take appropriate preventive measures to eliminate these hazards from overwhelming them.

SECTION I – HEAT INJURIES**HOW SERVICE MEMBERS SUSTAIN HEAT INJURY**

2-1. Service members participating in military operations or training sessions during intense heat conditions are the most susceptible to heat injury. Service members, who do not heed this environmental hazard and drink enough fluids during the intense heat like those of the SWA deserts, will be eventually counted as a DNBI loss to their unit. During hot weather deployments service members need to guard themselves against the extreme temperatures (both heat and cold), sometimes, very high humidity (along coastal areas of the Persian Gulf).

2-2. Heat, high humidity, and exposure to the sun make it difficult for the body to regulate its temperature. Add to this difficulty, service members who sometimes pack over a hundred pounds equipment on their backs in stifling heat, and the leader, as well as the service member, have concocted a recipe for heat injury (heat exhaustion or heat stroke) disaster. When the body loses its body fluids faster than it can replace them, the body loses every time. That condition is known as dehydration.

1 2-3. Dehydration reduces the benefits of heat acclimatization and physical
2 fitness. It increases the risk of heat illness, and reduces work capacity,
3 appetite, and alertness. The greater the dehydration, the more severe the
4 effects are likely to be.
5

6 2-4. Service members under stress (combat) in a hot environment will
7 exhibit "voluntary dehydration." During these times they will maintain about
8 1.5 quarts—sometimes more, below their ideal hydration level and will do so
9 without little sense of thirst. Service members must constantly remind
10 themselves, or be reminded by their buddies, and/or leaders, to drink to
11 replace lost sweat.
12

13 2-5. Sometimes the high chlorine levels required to sanitize water may cause
14 service members to drink less than they need until they get used to the taste.
15 Ensuring adequate water consumption is the responsibility of the unit
16 leadership. Newly introduced Hydro Pack Filtration (HPF) pouches and well
17 systems provides for no chemical additives for those service members who are
18 on the move and away from certified sources of sanitized water during
19 ongoing operations. These systems will filter bacteria, viruses, cysts, and
20 other dangerous contaminants by using a proprietary reverse osmosis
21 membrane.
22

23 2-6. Service members must presume that all water, beverages and food from
24 non-US military sources are contaminated.
25
26

27 DIFFERENT TYPES OF HEAT INJURIES

28

29 2-7. There are many forms of heat injury. The mildest form of heat injury is
30 heat cramps that occur when service members do not drink enough fluids
31 when working or exercising.
32

33 2-8. Heat cramps are due to excessive salt and water losses, which cause
34 muscle cramps in the abdomen, legs, and arms. A service member can avoid
35 heat cramps by first becoming acclimatized to the environment, and then,
36 maintaining proper nutrition and hydration.
37
38
39

40 **CAUTION**

41 One heat casualty is usually followed more.
42 The occurrence of just one heat casualty could
43 signal that the entire unit may be in immediate
44 risk of heat injuries.
45
46
47

48 2-9. Heat exhaustion is a more serious injury than heat cramps. Excessive
49 sweating and inadequate fluid replacement trigger heat exhaustion. The
50 body is unable to supply the increased blood volume needed by the brain, skin
51 and the muscles in extreme heat.
52

2-10. The result is dizziness, weakness, and fainting, vomiting, mild changes in mental function (confusion, disorientation, and irritability), and elevated body temperature. Employing appropriate work/rest cycles and consuming adequate amounts of fluid can avoid heat exhaustion (refer to Tables 2-1 through 2-5).

Table 2-1. Work/Rest and Water Consumption Table

WORK INTENSITY	ACTIVITY
VERY LIGHT	Lying On Ground, Standing In Foxhole Sitting in Truck, Guard Duty Driving Truck
LIGHT	Cleaning Rifles Walking on Hard Surface at 1m/s No Load Walking on Hard Surface at 1m/s 20-kg Load Manual of Arms Walking on Hard Surface at 1m/s 30-kg Load
MODERATE	Walking on Sand at 1m/s No Load Walking on Hard Surface at 1.56m/s No Load Walking on Hard Surface at 1m/s 20-kg Load Calisthenics, Scouting Patrol Pick And Shovel, Crawling Full Pack Foxhole Digging, Field Assaults
HEAVY	Walking on Hard Surface at 1.56m/s 30-kg Load Walking on Hard Surface at 2m/s No Load Emplacement Digging

2-11. The following Tables, Tables 2-2 through 2-5, were prepared using United States Army Research Institute of Environmental Medicine (USARIEM) Heat Strain Model. Assumptions used in generating this table include: 1) troops fully hydrated, rested and acclimatized, 2) wind speed—2 meters per second, 3) clear skies (full solar load), and 4) heat casualties, 5%.

2-12. This guidance should not be used as a substitute for common sense or experience. Individual requirements may vary greatly. The Legend for each of these tables is the same as the Legend shown for Table 2-2.

Table 2-2. Number Of Minutes Of Work Per Hour In Work/Rest Cycle

			DBDU				DBDU& FLAK				DBDU&BDO (MOPP IV)				CVC & ARMOR				CVC & BDO & ARMOR (MOPP IV)			
WBGT	TA	RH	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H
82	87	20	NL	NL	33	21	NL	NL	36	23	NL	NA	NA	NA	NL	NL	NL	25	NL	25	1	5
86	91	20	NL	NL	30	20	NL	NL	34	22	NL	NA	NA	NA	NL	NL	35	23	NL	19	7	NA
88	94	20	NL	NL	28	18	NL	NL	31	20	NL	NA	NA	NA	NL	NL	NL	22	NL	13	NA	NA
90	96	20	NL	NL	26	17	NL	NL	30	19	NL	NA	NA	NA	NL	NL	32	21	NL	NA	NA	NA
98	120	20	NL	NA	NA	NA	NL	9	NA	NA	NA	NA	NA	NA	NL	12	5	NA	NA	NA	NA	NA
115	120	60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LEGEND:
 WBGT–Wet Bulb Globe Temperature (°F) T_a–Ambient Temperature (dry bulb °F) RH–Relative Humidity
 VL–Very Light Work Intensity L–Light Work Intensity M–Moderate Work Intensity
 H–Heavy Work Intensity Flak–Flak Vest
 CVC–Combat Vehicle Crewman Coverall DBDU–Desert Battle Dress Uniform
 NL–No Limit (continuous work possible) BDO–Battledress Overgarment

This table provides for four levels of work intensity (see table 2-1), the number of minutes work per hour in work/rest schedules tailored to the conditions specified. Spend the remainder of the hour at rest. Appearance of heat casualties is evidence that the selected work/rest cycle is inappropriate for the conditions.

Table 2-3. Water Requirement To Support Work/Rest Cycles (Quarts [Qts]/hr)

			DBDU				DBDU& FLAK				DBDU&BDO (MOPP IV)				CVC & ARMOR				CVC & BDO & ARMOR (MOPP IV)			
WBGT	TA	RH	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H
82	87	20	0.7	1.0	1.1	1.1	0.7	1.0	1.1	1.0	1.1	NA	NA	NA	0.7	0.9	1.2	1.0	1.0	1.0	1.0	0.9
86	91	20	0.8	1.1	1.1	1.1	0.8	1.0	1.1	1.1	1.2	NA	NA	NA	0.8	1.0	1.1	1.0	1.1	1.1	1.0	NA
88	94	20	0.9	1.2	1.2	1.2	0.9	1.1	1.1	1.1	1.3	NA	NA	NA	0.9	1.1	1.1	1.1	1.1	1.1	NA	NA
90	96	20	1.0	1.2	1.2	1.2	0.9	1.1	1.2	1.1	1.3	NA	NA	NA	0.9	1.1	1.1	1.1	1.2	NA	NA	NA
98	120	20	1.7	NA	NA	NA	1.5	1.4	NA	NA	NA	NA	NA	NA	1.6	1.6	1.5	NA	NA	NA	NA	NA
115	120	60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2-4. Maximum Continuous Work Times (Minutes)

*

			DBDU				DBDU& FLAK				DBDU&BDO (MOPP IV)				CVC & ARMOR				CVC & BDO & ARMOR (MOPP IV)			
WBGT	TA	RH	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H
82	87	20	NL	NL	133	62	NL	NL	196	68	NL	89	43	29	NL	NL	NL	76	NL	161	52	35
86	91	20	NL	NL	110	58	NL	NL	139	64	NL	82	42	27	NL	NL	NL	73	NL	121	49	34
88	94	20	NL	NL	97	55	NL	NL	119	61	NL	77	41	27	NL	NL	NL	70	NL	106	48	33
90	96	20	NL	NL	91	53	NL	NL	109	59	NL	75	40	26	NL	NL	141	69	NL	98	47	32
98	120	20	NL	75	44	31	NL	94	50	36	91	54	33	19	NL	112	5	43	95	56	35	21
115	120	60	33	21	11	7	37	24	12	8	60	42	24	13	26	17	NA	6	53	37	20	11

Table 2-5. Water Requirements for Maximum Continuous Work (Qts/Hour)

			DBDU				DBDU& FLAK				DBDU&BDO (MOPP IV)				CVC & ARMOR				CVC & BDO & ARMOR (MOPP IV)			
WBGT	TA	RH	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H	VL	L	M	H
82	87	20	0.7	1.0	1.4	1.8	1.1	1.7	2.0	2.0	1.1	1.7	2.0	2.0	0.7	0.9	1.2	1.5	1.0	1.4	2.0	2.0
86	91	20	0.8	1.1	1.4	1.9	0.8	1.0	1.1	1.1	1.2	1.7	2.0	2.0	0.8	1.0	1.1	1.0	1.1	1.5	2.0	2.0
88	94	20	0.9	1.2	1.5	2.0	0.9	1.1	1.1	1.1	1.3	1.8	2.0	2.0	0.9	1.1	1.1	1.1	1.1	1.5	2.0	2.0
90	96	20	1.0	1.2	1.6	2.0	0.9	1.1	1.2	1.1	1.3	1.9	2.0	2.0	0.9	1.1	1.1	1.1	1.2	1.6	2.0	2.0
98	120	20	1.7	2.0	2.0	2.0	1.5	1.4	2.0	2.0	2.0	2.0	2.0	2.0	1.6	1.6	1.5	NA	1.8	2.0	2.0	2.0
115	120	60	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

* NOTE: Volumes listed are required to support work/rest schedules in Table 2-4; drinking should be divided over the course of each hour. If the water requirements exceeds 1.5-quart sweat loss is greater than the maximum hourly absorption rate of the gut, Service members should drink extra water during periods of lower water requirements to make up loss.

2-13. The most serious form of heat injury is life-threatening heat stroke (sometimes called sun stroke). Heat stroke occurs when the body's sweating mechanism shuts down. The result is the skin become hot and dry, and the body is depleted of fluids.

1 2-14. Its symptoms include the above heat injuries signs and symptoms but
2 are more severe and can be fatal. In addition to these symptoms, the service
3 member's skin may dry, red (flushed) hot, fast pulse and respiration,
4 seizures, he may collapse and suddenly become unconscious. Once the service
5 member's condition reaches this point it is a medical emergency.

- 6 • Cool the service member immediately by loosen or removing his
7 clothing if the situation permits. Start cooling the service member
8 immediately by spraying or pouring water on him. Fan him and
9 massage his extremities and skin, elevate the service member's legs.
- 10 • If conscious, have the service member slowly drink at least one canteen
11 full of cool water. Evacuate as soon as possible to a medical treatment
12 facility (MTF). When in a chemical environment, do not loosen or
13 remove a heat casualty's clothing. Move the casualty to clean area and
14 give him water to drink.

15 16 **Heat Injuries Can Be Prevented**

17
18 2-15. Fluid replacement is essential in preventing heat injury. Appropriate
19 physical conditioning and becoming acclimated to the climate also are
20 important. Recognition of the early symptoms of heat injury by service
21 members is critical. The longer a service member waits after recognizing the
22 symptoms of the heat injury, the more severe the heat injury.

23 24 **Preventative Tips To Help Service Members Avoid Heat Injury**

25
26 2-16. Drink plenty of fluids when participating in an activity, even if you are
27 not thirsty. Preconditioning will help your body cope with the heat and
28 humidity. Take as many breaks as possible in hot weather. Do not over exert
29 yourself especially if you have not properly acclimated for the activity or to
30 the geographic climate.

31
32 2-17. If possible do physical work in the early morning or late afternoon when
33 the temperature is cooler. The sun's rays are most intense between 1000 and
34 1600 during the day. If you believe someone is suffering from overexposure to
35 heat, immediately seek medical care for the service member.

36
37 2-18. Until help arrives, you should move the victim to a shaded area; remove
38 any excess clothing; wet and fan the Service Member's body; elevate the
39 service member's legs and buttocks.

40
41 2-19. Heat exhaustion is a serious illness caused by heat. Over exertion or
42 profuse sweating in a hot, humid, poorly ventilated environment often brings
43 it on. During prolonged heat waves, the very young and the very old are also
44 often at risk, even if they are not active.

45
46 2-20. Luckily, *if* heat exhaustion is recognized and treated promptly, the
47 effects can easily be reversed.

1 **Signs And Symptoms Of Heat Exhaustion**

2
3 2-21. There are several signs and symptoms that should key a service
4 member that he or another service member is starting to be overcome by heat
5 exhaustion, the most readily noticeable ones are:

- 6
7
 - 8 • Feeling weak, faint, or dizzy, with an accompanying headache or
9 nausea.
 - 10 • Cold, clammy skin with ashen pallor.
 - 11 • Dry tongue and thirst.
 - 12 • Severe muscle fatigue.
 - 13 • Loss of appetite.
 - 14 • Profuse sweating.
 - 15 • Physical collapse, with muscle fatigue and sometimes cramping.
 - 16 • Treating heat exhaustion

17 2-22. The two basic steps in treating heat exhaustion are to:

- 18
 - 19 • Replenish the body's lost fluids.
 - 20 • Lower the body's temperature. Then-
 - 21 ▪ Move the person into a cool place out of the sun.
 - 22 ▪ Loosen any tight-fitting clothing and remove any extra layers of
23 clothing.
 - 24 ▪ Offer the person fluids such as water, fruit or vegetable juices, or
25 sports drinks. Do not offer drinks that contain alcohol or caffeine.
26 Encourage the person to drink about a half glass of fluid every 15
27 to 20 minutes.
 - 28 ▪ Help the person cool off by sponging him or her with cool water, or
29 applying cool, wet cloths such as towels or sheets. In most cases,
30 the person will begin to feel better within 30 minutes. If symptoms
31 do not clear up, or if the person begins to lose consciousness, call
32 for emergency medical assistance.

33 **Additional Risk Factors**

34
35 2-23. Certain health and lifestyle conditions can increase your risk of
36 developing heat exhaustion. These include: Poor circulation, inefficient sweat
37 glands and other changes in skin condition brought on by the normal aging
38 process. Recent or recurrent illness accompanied by a fever. Drugs and
39 medications that increase heat production by the body or affect the body's
40 ability to regulate its temperature. These can include diuretics, laxatives,
41 antihistamines, amphetamines and anti-depressants. Drinking alcohol,
42 overdressing or overeating.

43
44 **Drink Plenty Of Water**

45
46 2-24. Depending on the heat and activity level, you may need to drink from
47 $\frac{1}{2}$ to 1 and $\frac{1}{4}$ quarts of water per hour—*3 gallons/12 liters per day in hot,*
48 *dry climates. Drinking water is a must in order to prevent heat injury.* If
49 desired, individuals may add flavoring to the water to enhance consumption.
50 Field rations/meal(s), ready to eat (MRE) have flavoring for water in each
51 meal. If flavoring is used, *add the flavoring to the water in your canteen cup*
52 *only.*

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2-25. *Do not* add flavoring to the water in your canteen; it increases the risk of contamination and illness.

2-26. Never flavor the bulk source water supply. (Flavoring the bulk source water supply will reduce the action of water disinfectants.) See Table 3-1 in chapter 3 for water intake requirements.

- Drink extra water *before* starting any mission or hard work. Cool water (60° to 70° Fahrenheit [F]) is absorbed faster than cold water.
- Drink small quantities of cool fluids frequently.
- Carbohydrate/electrolyte beverages (sport drinks) may provide supplemental nutrients under conditions of extreme calorie and water requirements; such as extremely vigorous activity. However, they cannot replace and must not be used to meet all water requirements.
- Do not add carbonated beverage powders Kool-Aid, or similar flavoring to water that is being disinfected with either chlorine or iodine until the required time for disinfection is passed. The flavoring can react with the disinfectant.
- Drink “non-caffeinated” fluids even if you are not thirsty. (Caffeine increases water requirements in all environments.)
- Refill your canteens at every opportunity, using only treated water, if possible.

<p style="text-align: center;">WARNING</p> <p>The color and volume of a service members the urine stream are good indicators of a service member’s hydration status. If the urine stream is dark yellow and the volume is small, or if you are constipated and experience hard stools, you may not be drinking enough water. Maintain a urine stream that is clear or light yellow. The darker the color of the urine stream the more water your body will require to get back to a clear or light yellow. Remember, that thirst is not a good indicator of dehydration during physical activity. Watch the color or the urine stream and act accordingly.</p>
--

Use Work/Rest Cycles

2-27. Work and rest as your leader directs (refer to Table 2-1 through 2-5). A rest period helps prevent dangerous increases in body temperatures by minimizing heat production. When possible, service members should work and rest in the shade, if possible.

Eat All Meals To Replace Salts

2-28. Eating all meals in the field will usually provide the body’s requirements for salts. Field rations/MRE meet the daily requirements for

minerals and electrolytes (sodium). *Do not take extra salt in meals* unless medically indicated.

CAUTION

Do not take salt tablets. One salt tablet increases your water requirement by at least a pint. Salt draws water from muscles to dilute your blood. Salt tablets can cause vomiting further drawing fluids and electrolytes from your body.

Recognize The Risk Of Mission-Oriented Protective Posture/Body Armor/Armored Vehicles

2-29. All service members who are in mission-oriented protective posture (MOPP)/body armor increases your heat stress. In order to avoid heat injury the service member must—

- Drink more water. *DO NOT EXCEED 1 and 1/4 QUARTS PER HOUR.*
- Work and rest as directed by your leader.
- Service members may be at a greater risk of heat injuries when in armored vehicles—you may need to drink more water.

Modify Your Uniform

2-30. When directed/authorized by your commander to reduce heat stress and to protect against ultraviolet (UV) radiation, the service member should—

- Untuck pants from boots.
- Cover all skin exposed to sun; wear sunscreen and lip balm with a sun protection factor (SPF) of 15 or higher.
- Protect the eyes from UV with UV-protective sunglasses, especially wraparound sunglasses.
- Seek shade when resting outdoors.
- Keep clothing loose at the neck, wrists, and lower legs.
- When the threat from biting arthropods is high, keep your shirtsleeves rolled down and pants tucked in boots (refer to FM 21-11, for information on heat injury prevention and first aid).



2-31. Cold injuries are most likely to occur when an unprepared individual is exposed to winter temperatures. They can even occur with the proper planning and equipment. The cold weather and the type of operation in which the individual is involved impact on whether a service member is likely to be injured and to what extent. The service member’s clothing, physical condition, and mental makeup are also determining factors. Well-disciplined and well-trained service members can be protected, even in the most adverse conditions. Service members and their leaders must know the hazards of exposure to the cold.

1
2
3 2-32. They must know the importance of personal hygiene, exercise, care of
4 the feet and hands, and the use of protective clothing.
5

6 2-33. Cold injuries may be divided into “freezing and nonfreezing” types. An
7 example of a freezing type is frostbite. The nonfreezing types are chilblains,
8 trench foot, and immersion foot (refer to FM 21-11).
9

- 10 • Frostbite can occur when the temperature is at, or near, freezing or
11 colder. Frostbite can also occur when the skin is exposed to winds of less
12 than five miles per hour and actual temperature readings of 30° F.
- 13 • Immersion Syndrome (trench foot and immersion foot) results from the
14 feet being exposed for fairly prolonged periods of time to a wet, cold
15 condition, or the outright immersion of the feet in water with a
16 temperature of 32° to 50° F. The symptoms are a sensation of pins and
17 needles, tingling, numbness, and then pain.
- 18 • The skin will initially appear wet, soggy, white, and shriveled. Inactive
19 feet in damp or wet socks and boots, or boots that are laced too tightly
20 may impair circulation, and may make the Service Member more
21 susceptible to injury.
- 22 • This injury can become very serious and if not taken care of, could result
23 in the loss of toes or parts of the feet.
- 24 • At the upper range of temperatures, exposure of 12 hours or more will
25 cause injury. Shorter duration at or near 32° F can cause the same
26 injury if precautions are not taken. Secondary reaction is that parts of
27 the feet may feel hot, and burning and shooting pains may begin,
28 swelling and redness and even hemorrhaging (bleeding) may occur.
- 29 • Injury is usually associated with immobilization of the feet once they
30 become wet and chilled for prolonged periods of time.
31

32 WEAR UNIFORM PROPERLY

33
34 2-34. Soldiers should wear the clothing your commander and leaders direct.

- 35 • It should be worn in loose layers (top and bottom).
- 36 • Avoid tight clothing, including tight underwear.
- 37 • Keep clothing clean and dry.
- 38 • Remove or loosen excess clothing when working or in heated areas to
39 prevent sweating.
40

41 2-35. Wear headgear to prevent body heat loss. The body loses large amounts
42 of heat through the surface of the head (as much as 50 percent of the body's
43 heat can be lost by not covering the top of the head in cold environments).
44

45 2-36. Avoid spilling fuel or other liquids on clothing or skin. Evaporating
46 liquids increase heat loss and cool the skin. Also, liquid stains on clothing will
47 reduce the clothing's protective effects. Change wet/damp clothes as soon as
48 possible. Wet/damp clothing pulls heat from body.
49

50 KEEP YOUR BODY WARM

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52 2-37. In cold weather climates service members should keep moving, if
53 possible. They should exercise their body's big muscles (arms, shoulders,

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trunk, and legs) frequently to keep warm. If they must remain in a small area, exercise their toes, feet, fingers by wiggling them and or rotating them in tight circles, flexing the fingers and toes together and spreading them apart rapidly. They should also:

- Avoid the use of alcohol as it makes your body lose heat faster.
- Avoid standing directly on cold, wet ground, when possible.
- Avoid the use of tobacco and products that decreases blood flow to the skin.
- Eat all meals to maintain the service member's energy.
- Drink plenty of water and/or warm nonalcoholic fluids.
- Darkly colored yellow urine means you are not drinking enough consumptions should be increased! Frequent and large volumes of fluids and clear urine indicate that fluid consumption should be reduced. Remember the body can dehydrate in cold climates too!
- Buddies should monitor each other for cold weather injury.

Protect Your Feet

2-38. Service members should pack several pairs of issued boot socks when they deploy. They should try to keep their socks clean and dry. They should change wet or damp socks as soon as possible. Socks can become wet from sweating. If possible, service members should dry boots and apply foot powder on their feet and in boots when changing socks. If possible, they should wash their feet daily, if possible. The service member should avoid tight socks and boots (completely lace boots up but as loosely as possible) as it affects the blood circulation to the lower legs and to the feet.

2-39. In cold wet temperatures the service member should wear overshoes to keep boots dry.

2-40. A decrease in physical activity reduces the exposure time necessary to produce injury.

2-41. In all types of footgear, feet perspire more and are generally less well ventilated than other parts of the body. Moisture accumulates in socks, decreasing their insulating quality. The feet are susceptible to cold injury and are less frequently observed than the remainder of the body.

Protect Your Hands

2-42. During operations in cold weather service members will wear gloves with inserts, or mittens with inserts. They can warm their hands under clothing if they become numb. The service members should avoid skin contact with snow, fuel, or bare metal. Waterproof gloves by treating with waterproofing compounds, such as snow seal.

CAUTION

Never touch soft skin surfaces to cold metal surfaces. For example, your face, tongue and soft skin tissues not normally exposed to severe cold.

Protect Your Face And Ears

2-43. When operations demand that the service member be out in the cold temperatures for long periods of time, they should cover their face and ears with a scarf or other material, if available. They should wear their insulated cap with flaps down or wear a balaclava and secure under their chin.

2-44. Service members can warm their face and ears by covering them with their hands. Do not rub face and ears or use face camouflage when the wind chill is -10° or below.

2-45. Camouflage on the face prevents detection of cold weather injury (frostbite). Rubbing cold extremities can be potentially harmful. Frostbitten areas that are rubbed can cause additional injury to the affected areas. Wear sunscreen. Solar UV exposure is doubled when you are surrounded by snow. Exercise facial muscles.

Service Members Must Protect Their Eyes

2-46. When the service member is in a snow environment they should wear sunglasses (or goggles). (Sun, Wind, and Dust, National Stock Number [NSN] 8465-01-004-2893.) They will prevent snow blindness (gray lens insert for above system is NSN 8465-01-004-2891). Wear Spectacles, Protective, Laser-Ballistic, NSN 8465-01-416-4626, or Special Protective Eyewear, Cylindrical System, NSN 8465-01-416-4626.

2-47. Improvised sunglasses (slit goggles), if actual sunglasses are not available, can be made from the field rations/MRE cardboard box or other opaque material. (Keep eye slit openings as narrow as possible.)

Protect Your Buddy

2-48 Watch for signs of frostbite on the service member's exposed skin. The affected skin will appear as pale/gray/waxy areas (it may be hard to see these changes in poor lighting or on service Member with dark skin). Ask the service member if his feet, hands, ears, or face are numb and need *rewarming*.

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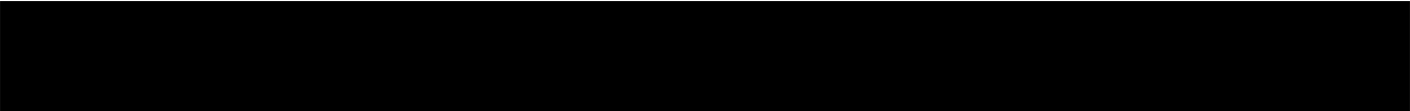
2-49. There are a number of precautions that must be followed by all service members in cold temperature environments that must be followed:

- *Do not* allow the service member to sleep directly on the ground.
- *Do not* let the service member sleep in or near the exhaust of a vehicle with the engine running; or, let a service member sleep in an enclosed area where an open fire is burning. Carbon monoxide poisoning is a silent, odorless killer.

2-50. Service members may check the circulation in the fingers and the toes by pinching the nail beds (the surface directly beneath the nails) and checking how fast the color returns in the beds under the nails.

<p>CAUTION</p> <p>The slower the return to a natural color, the more serious the potential for frostbite on the fingers and the toes.</p>
--

2-51. During extended activities in a cold environment, warming areas should be provided; for example, a service member performing guard duty. See TB MED 580, GTA 8-6-12, and FM 21-11 for information and cold injury first aid procedures.



2-52. The most effective and obvious means of preventing exposure to arthropods is to avoid their known habitats. Absolute avoidance of arthropod pests is often neither practical nor possible.

2-53. If the tactical situation allows, choose bivouac sites that are dry, open, and as uncluttered as possible. Avoid sites with rodent burrows and proximity to local settlements, animal pens, and other areas where arthropod infestations are likely to be concentrated.

AVOID CONTACT WITH INDIGENOUS HUMAN POPULATIONS

2-54. Limit or avoid contact with indigenous human populations in lesser-developed countries because they are often reservoirs for many diseases of military importance.

2-55. Poor sanitation and improper waste disposal under wartime conditions greatly increase the disease vector potential of such common pests as filth flies and rodents.

2-56. In mobile field situations “camp followers” have historically amplified sanitation problems, often resulting in epidemics of diarrheal diseases that have caused many casualties. This threat is even greater in urban areas converted to temporary or semipermanent military use. A dangerous temptation in field training or in deployment operations is to ignore the field

1 sanitation standards for those other than our own service members.
2

3 2-57. Some people think, “The rules don’t apply here.” Yielding to that
4 temptation can cost your health and the health of those around you. There is
5 no excuse for forgetting to bring protective equipment or failing to use it. Be
6 sure to follow all safety precautions on all labels of the pesticides that you
7 use. They are there for a reason—to protect your health.
8

9 **USE THE DEPARTMENT OF DEFENSE INSECT/ARTHROPOD**
10 **REPELLENTS**

11
12 2-58. The concurrent use of a skin insect repellent (N, N-diethyl-m-toluamide
13 or N,N-diethyl-3-methylbenzamide [DEET], national stock number (NSN)
14 6840-01-284-3982) and clothing insect repellent (permethrin [NSN 6840-01-
15 278-1336 and 6840-01-345-0237]) is necessary to obtain maximum protection
16 against insects/arthropods. Since 1957, the military has used DEET as it's
17 standard skin repellent. DEET is effective against a wide variety of
18 arthropod species, especially mosquitoes and other biting flies, but also fleas,
19 ticks, and chigger mites.
20

21 2-59. In addition, DEET has been reported to provide effective protection, in
22 areas where land leeches are a problem, primarily Southeast Asia.
23

24 2-60. Apply DEET insect repellent to all exposed skin. Follow all label
25 directions. Apply a light, even coating to exposed skin, not under clothing.
26

27 2-61. *DO NOT* apply to the eyes and lips, or to damaged skin.
28

29 2-62. One application may last 8 to 12 hours; if the service member receives
30 bites, he may reapply a light uniform coating of repellent.
31

32 2-63. Camouflage face paint (NSN 6849-01-493-7334) that already has DEET
33 incorporated into it is also available. Reapplication of DEET may be
34 necessary (check container label) due to heavy sweating, or after river-
35 crossing operations, exposure to rain, or in locations where arthropod density
36 is very high.
37

38 2-64. Application of DEET can be safely used with sunscreen. Apply the
39 sunscreen first and allow to bind to the skin for 1/2 hour. Then apply a thin
40 layer of DEET.
41

42 2-65. Permethrin ([3-phenoxyphenyl] methyl [+/-] cis/trans 3-[2,2-
43 dichloroethenyl] 2,2-dimethyl-cyclopropanecarboxylate) is the most recent
44 addition to the arsenal of personal protective repellents, and is the most
45 effective clothing impregnant available. Its primary mode of action is contact
46 toxicity, particularly against crawling arthropods such as ticks, chigger
47 mites, fleas, and lice.
48

49 2-66. Permethrin also acts as a contact repellent against mosquitoes, biting
50 flies and to a lesser degree, kissing bugs. It is odorless, nonirritating, and
51 resistant to washing and wears abrasion (rubbing off) Permethrin is bound so
52 strongly to most fabrics that detergent and water will not remove it.
53

1
2 **Individual Dynamic Absorption (IDA) Kit**
3

4 2-67. This item is a protective treatment kit for military field uniforms that
5 is intended for use by the individual. It provides excellent long-term
6 protection (one treatment is effective in preventing mosquito bites through
7 the fabric for over 50 launderings).
8

9
10 2-68. The IDA kit is sometimes referred to by the nicknames "baggie method"
11 or "shake and bake." The kit contains materials sufficient to treat one
12 complete uniform (shirt and trousers): two plastic vials of permethrin (40-
13 percent emulsifiable concentrate [EC], 9-milliliter (ml) each), two plastic
14 treatment bags, two pieces of twine, one pair of disposable protective gloves,
15 and one black marking pen (one pen per four kits) (refer to Figure 2-1).
16

17 2-69. This item is perhaps the safest and most environmentally friendly
18 method by which individuals can treat their uniforms.
19

20 2-70. An excellent way to train personnel in its correct use is to instruct the
21 unit on its use during a unit formation in conjunction with other unit
22 training. The unit leadership can thus ensure its personnel are protected
23 from arthropod-borne disease, that they have at least one treated uniform,
24 and that they know how to treat other uniforms.
25

26 2-71. Wear the protective gloves when mixing to avoid accidental exposure to
27 concentrated permethrin should spillage occur.
28

29 2-72. Treat the uniform shirt and trousers separately, following the
30 instructions printed on the back of each treatment bag (Figures 2-2 and 2-3).
31



45 Figure 2-1. Insect/Arthropod Repellent Treatment for Military Battle Dress
46 Uniforms, NSN 6840-01-345-0237

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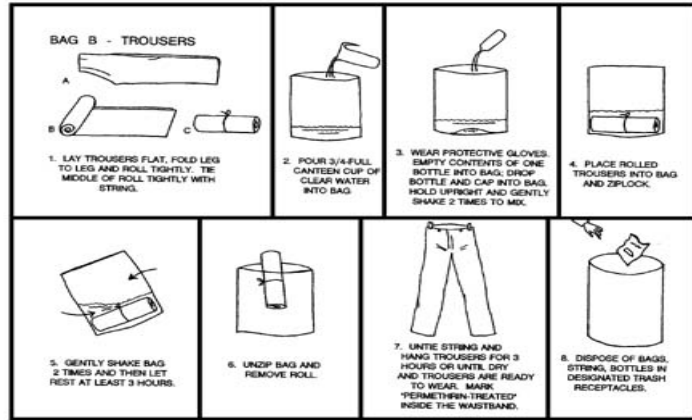


Figure 2-2. Treating Trousers with Permethrin

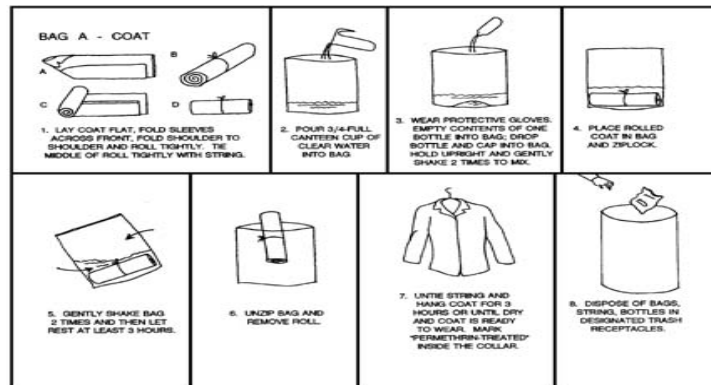
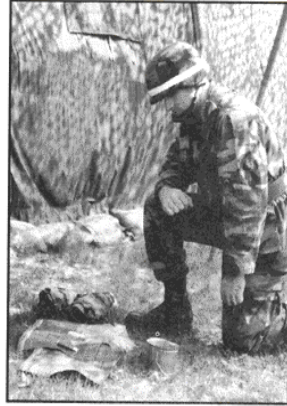


Figure 2-3. IDA kit Instructions For Treating Coat Half the Field Uniform with Permethrin, As They Appear On Bag A Of The Kit

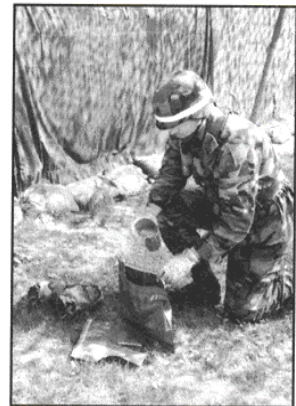
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2-73. See Figures 2-4 a, 24-b and 24-c for steps 1-9. Assemble all materials. (Step 1). Pour approximately 3/4 of a canteen cup (500 ml) of water into one of the bags.

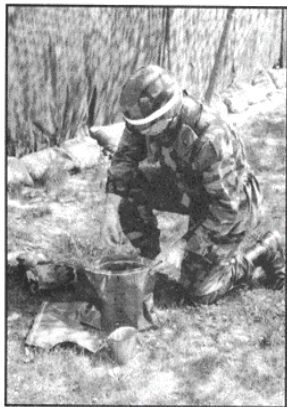
(Step 2), add the contents of one of the vials of permethrin (Step 3), and gently agitate to mix (Step 4).



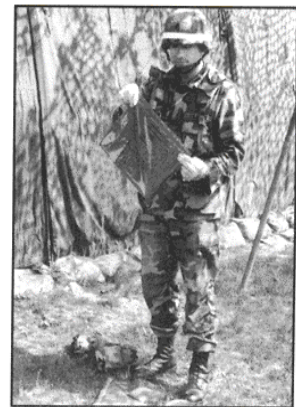
Step 1. Assemble Contents of the IDA Kit



Step 2. Add 3/4-Canteen Cup of Water to a Treatment Bag



Step 3. Add Contents of One Vial of 40-Percent Permethrin EC to a Treatment Bag



Step 4. Agitate Treatment Bag to Mix Water and Permethrin

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Figure 2-4A. Steps 1-4 In Using The IDA Kit, NSN 6840-01-345-0237

2-74. After rolling and tying the garment according to the instructions, place it in the bag (Step 5), re-seal the bag, agitate again (Step 6), and allow to sit for approximately 3 hours (Step 7). During this time, all the liquid is absorbed by the garment. Open the bag, remove the garment, and hang until dry (usually 2-4 hours) (Step 8).

2-75. Once dry, permethrin has no odor and does not affect the appearance of the fabric. The uniform may now be safely handled and worn. The fabric has been impregnated with permethrin at the rate of 0.125 mg/cm².

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Permethrin is bound so strongly to the fabric by this procedure that water will not remove it.

2-76. *Permethrin will not wash out of treated uniforms when worn in the rain, or when fording streams, and rivers.*

2-77. With the black pen, mark the inside coat collar and the inside waistband Perm treat, mo/yr. This stands for 'Permethrin treated, month/year.



Step 5. After Rolling and Tying the Garment, Place it in the Treatment Bag



Step 6. Agitate the Treatment Bag to Initially Wet the Whole Rolled Garment



Step 7. Allow Garment to Sit in Treatment Bag for 3 Hours, or More, Until All the Liquid is Absorbed



Step 8. Remove Garment from Treatment Bag and Hang for 3 Hours, or More, Until Completely Dry

CAUTION

Do not treat the underwear or cap. Remember that dry-cleaning will completely remove permethrin.

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Step 9. Place All Used IDA Kit Components Into one Treatment Bag, Seal the Bag, and Put in Trash.

Figure 2-4C. Step 9 In Using The IDA Kit, NSN 6840-01-345-0237 (Continued).

2-78. *DO NOT re-treat the uniform*: one treatment is effective in preventing mosquito bites through the fabric for the over 50 launderings.

2-79. Starching field uniforms prior to treatment with permethrin does *not* adversely affect impregnation. Homogeneous absorption of permethrin is achieved in both hot and temperate-weather uniforms whether or not they are starched prior to treatment.

2-80. Permethrin-impregnated and untreated temperate-weather field uniforms *can* be laundered together. No significant transfer of permethrin from treated to untreated uniforms occurs during laundering.

2-81. Store as described in paragraph 2-89 below. Under optimum conditions, the shelf life of this product is indefinite. If deterioration of the containers, and/or leakage of the contents, is detected prior to this time, turn in the product for proper disposal.

2-82. Do not reuse empty treatment bags. Place all used kit components into one treatment bag (Step 9), seal the bag, and put in the trash. In contingency situations, remember to dispose of used kit components in accordance with operational guidance.

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2-83. This product is flammable and must be shipped in accordance with Department of Transportation (DOT) regulations.

2-84. Aerosol spray, (Insect Repellent, Clothing Application, Aerosol, Permethrin Arthropod Repellent, NSN 6840-01-278-1336):

- This product contains 0.5-percent permethrin in a 6-ounce can (Figure 2-5). The repellent can be used by the individual to treat field clothing (Figure 2- 8), as well as head nets (Figure 2-9) and mosquito netting.
- *DO NOT TREAT THE UNDERWEAR OR CAP.* This aerosol formulation of permethrin is also available commercially under several different trade names.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

SHAKE WELL BEFORE USING.

To be used for treatment of hot weather and temperate military field clothing and mosquito netting only. Make all applications outdoors. DO NOT TREAT UNIFORM CAP.

For protection against mosquitoes and ticks select an outdoor area protected from the wind, spray outer surfaces of clothing (while not being worn) and mosquito netting with a slow sweeping motion to lightly moisten the surface of the fabric. Treat the clothing for a minimum of 30 seconds on each side and allow 2 hours (4 hours under humid conditions) to dry prior to being worn. Hold can at a distance of 6 to 8 inches from the object being treated. Treatment should moisten the surface of the fabric enough to cause a slight color change. Use approximately ¾ of this container to treat one complete field uniform. Use remainder on mosquito netting.

Treat the entire outside surface of clothing with special attention to socks, trouser cuffs, and shirt cuffs. Pant cuffs should be worn inside the socks or footwear to ensure full protection against ticks and chiggers. This item must be used in conjunction with the standard issue repellent approved for application to exposed skin areas to achieve maximum protection from mosquitoes. Follow standard field uniform laundering procedures weekly. Reapply after six weeks and sixth laundering.

DISPOSAL: Replace cap, wrap container in several layers of newspaper. Discard in trash. Do not incinerate or puncture. In field situations bury the container.



6840012781336

**Precautionary Statements
Hazards To Humans
And Domestic Animals
CAUTION**

Avoid contact with face, eyes, or skin. Avoid breathing vapors or spray mist. Wash thoroughly after handling and before eating or smoking. Do not allow contact with treated surfaces until spray has dried. Do not allow spray to contact food, or water supplies. Thoroughly wash dishes and food handling utensils contaminated with this product.

Statement of Practical Treatment

If On Skin: Wash affected areas of skin with soap and water.

If In Eyes: Flush eyes with plenty of water. Contact a physician if irritation persists.

If Inhaled: Remove affected person to well-ventilated area, if not already done. Apply artificial respiration if indicated.

Physical Hazards

Contents under pressure. Do not use or store near heat or open flame. Do not puncture or incinerate container. Exposure to temperatures above 130 Degrees F may cause bursting.

**EPA REG. NO.: 50404-5
EPA EST. NO.: 10900-OH-1
COULSTON INTERNATIONAL
CORPORATION
P.O. BOX 30
EASTON, PA 18044**

NSN 6840-01-278-1336
CAGE 0C4A6
PERMETHRIN ARTHROPOD REPELLENT
Insect Repellent, Clothing Application
1 Each
DLA400-89-D-0147-0005
A02/91
DO NOT APPLY TO SKIN

Kills/Repels Mosquitoes and Ticks.

For Use and Distribution within the Department of Defense Only.

*Military Field Clothing and Mosquito Netting Only.

**ACTIVE INGREDIENT:
Permethrin 0.5%
INERT INGREDIENTS: 99.5%
100.0%

*Hot Weather (100% Cotton) and Temperate (Nylon/Cotton); 50:50 Field Uniforms Only.

**((3-phenoxyphenyl) methyl (+/-) cis/trans 3-(2, 2-dichloroethenyl) 2, 2-dimethyl cyclopropanecarboxylate *Cis/Trans* ratio: min. 35% (max. 40%) (+/-) *Cis* and max. 65% (min. 60%) (+/-) *trans*.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

See side panel for additional precautions.

Net Contents 6 oz.

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Figure 2-5. Insect Repellent Clothing Treatment

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2-85. All applications should be made outdoors. Select a location protected from the wind. Shake well before using. Holding the can at a distance of 6 to 8 inches from the clothing (while not being worn), spray with a slow, sweeping motion.

2-86. Spray the outer surfaces of the uniform, back and front, until the surface of the fabric appears moistened and a slight color change is noted (the original color will be restored when the uniform dries). Treat the shirt/blouse/coat and then the trousers, each for a minimum of 30 seconds on each side. Pay particular attention to the trouser cuffs and the shirt cuffs. Use approximately three-fourths of the can to treat one complete field uniform.

2-87. The outer surface of the socks may also be *lightly* sprayed, regardless of whether they are cotton, wool, or a synthetic. The most critical areas are the top and front portions of the socks. This will aid in protecting against chiggers and tiny immature ticks which may find their way through the boot eyelets.

2-88. The top edge and eyelet areas of the boot itself may also be lightly sprayed. The remainder can be used to treat mosquito netting.

- Allow the uniform to dry completely before being worn. This takes approximately 2 hours (or up to 4 hours under humid conditions).
- If possible, and if time permits, allow uniform to dry in a shaded area because sunlight hastens degradation of permethrin. Permethrin has no odor once dry.
- Follow standard field uniform laundering procedures weekly.
- Reapply after 6 weeks or the sixth laundering, whichever comes first.

WARNING
Remember--Dry-Cleaning WILL Completely Remove Permethrin.

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FIGURE 2-6.-APPLYING PERMETHRIN AEROSOL TO THE FIELD UNIFORM.



FIGURE 2-7. APPLYING PERMETHRIN AEROSOL TO INSECT HEAD NET.

2-89. Storage and Disposal of Aerosol Permethrin. The aerosol should be stored at temperatures between 32°F and 130°F. At temperatures above 130°F there is increased chance of the can bursting. At temperatures below 32°F, permethrin will begin to crystallize out of solution, although upon return to temperatures of 60-80°F, it re-dissolves with no apparent effect on the quality of the product. Under optimum storage conditions, the shelf-life of the aerosol is indefinite. If deterioration of the can, leakage of the contents, or loss of propellant is detected prior to this time, turn in the product for proper disposal. Cans should be checked carefully after 5 years to ensure that they are still functional.

- After the contents of the can have been dispensed, replace the cap, wrap the container in several layers of newspaper and discard in the trash per label instructions. Do not puncture or incinerate. In contingency situations, dispose of permethrin in accordance with operational guidance.
- This product is *not* flammable, and may be safely carried aboard aircraft. Refer to DOT regulations for detailed guidance.

2-90. Permethrin is the most effective clothing repellent available. Treat military field uniforms, tent liners, ground cloths, and bed nets with permethrin. This should be done before wearing in field training or military operations. Always follow label instructions when applying to clothing. Permethrin will remain in the material after repeated washings.

2-91. The aerosol spray can treatment will last through 6 washes. The impregnation kit (IDA) or "baggie method" will last through fifty washes.

2-92. Do not dry clean permethrin-treated uniforms as dry cleaning solvents will completely remove the permethrin. However, treated uniforms can be washed, dried, ironed, and starched. Treated uniforms can be safely worn in the rain or when crossing rivers or streams. Permethrin does not rinse out in cold water (or rain or streams).

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CAUTION

- *Do not* apply directly to skin, to underwear, or to cap.
- *Do not* wear treated uniforms unless they are first thoroughly dried after treating.
- Apply permethrin outdoors or in well-ventilated areas only.
- Wear uniform as your commander directs.
- Wear a loose fitting uniform, not tightly tailored, to prevent arthropods from biting through the fabric; repair tears/holes.
- When the arthropod threat is high–
 - Tuck pants in boots and completely lace boots.
 - Tuck undershirt in at waist.
 - Wear sleeves down.
 - Button blouse/shirt at the neck and wrist.
- Do not use aftershave lotion, cologne, or perfumed deodorants or soaps in the field; they attract arthropods.
- Wear headgear (cap, helmet, arthropod head net) when necessary to protect your head.

Keep Body And Uniform Clean

2-93. Service members should bathe every day, if possible, using soap and potable drinking water daily (in lieu of soap and water, use unscented baby wipes) at least once a week. Good personal hygiene practices reduce infestation of insects such as body lice and mites. They should wash their uniform frequently (a minimum of every 7 days) to remove arthropods and their eggs that may be attached to the uniform. If the situation permits, they should use the quartermaster laundry; otherwise, they should use a stream, lake, or washbasin. Air-dry uniforms especially underwear and socks, if possible.

Follow Medical Advice

2-94. Take medications that help prevent diseases (such as anti-malaria pills) when directed by your commander. Use medications, such as cream/shampoo, when prescribed by medical personnel for treatment of lice, chiggers, poison ivy, and so forth.

Protect Yourself At Night

2-95. Service members must ensure their bed net is in good repair. They must use the bed net when sleeping. Its edges should be tucked under the sleeping pad or the sleeping bag so there are no openings. Service members must

1 follow the label directions and precautions when using DOD-approved insect
2 spray (for example, Insecticide, Aerosol d-phenothrin, 2%) if insects are
3 present inside the bed net (and inside closed tent). Allow vapors to disperse
4 for 10 minutes before entering the enclosure. Treat the bed net with
5 permethrin for added protection.
6

7 2-96. Repair holes in your bed net. Apply DEET skin repellent to those areas
8 likely to touch the insect net during sleep (knees, hands, elbows, and feet) to
9 prevent bites through holes in the fabric (always follow label instructions).
10

11 **Protect Yourself From Other Medically Important Arthropods And** 12 **Animals**

13
14 2-97. *Spiders, Scorpions, and Centipedes*—Remove all spiders that you find
15 from tents or buildings. Shake out and inspect clothing, shoes, and bedding
16 before use. Eliminate collections of papers, unused boxes, scrap lumber, and
17 metal. Clean beneath and behind large items thoroughly; spiders and
18 scorpions may be resting in these areas.

- 19 • Check field latrines before use; run a small stick under the rim of the
20 latrine hole to dislodge any spiders or scorpions there. Spiders and
21 scorpions may rest under toilet seat or inside latrine box.
- 22 • Wear gloves when handling paper, cloth, lumber, or other items that
23 have been stored for long periods.
- 24 • Check around rocks and logs before resting against them.
- 25 • Use a long-handled tool or stick to turn over debris before removing it.
- 26 • Remove accumulations of boards, rocks, and other debris to eliminate
27 the resting/hiding areas of spiders and scorpions.
- 28 • Wear leather gloves to remove rocks, lumber, and such from the ground.
- 29 • In many locations worldwide, centipedes are more of a problem than
30 scorpions, but the PMM are the same for both pests.

31
32 2-98. *Snakes*—Do not handle, play with, or disturb snakes or other wildlife.
33 Avoid swimming in areas where snakes abound. Keep hands off rock ledges
34 where snakes may be hiding or sunning. Look over the area before sitting
35 down, especially if in deep grass or among rocks.

- 36 • If snakes are known to inhabit the area, sleep off the ground, if possible.
- 37 • If military situation permits, avoid walking about an area during the
38 period from dusk to complete daylight, as many snakes are active during
39 this period.
- 40 • Avoid camping near piles of brush, rocks, or other debris.
- 41 • Never step over large rocks or logs without first checking to see
42 what is on the other side.
- 43 • When securing a rocky area, stand behind larger flatter rocks and
44 carefully lift the outer edges furthest away from your face and then
45 slowly raise it toward you.
- 46 • When it is necessary to move logs out of the way, check and make
47 sure first that no bees or wasps are nesting in partially hollowed
48 out spaces in logs as their home.
- 49 • Slowly roll the log toward you.
- 50 • By standing behind the objects and lifting or moving the objects
51 toward you, you will be shielding yourself should snakes that may be
52 resting or living beneath them.

- Handle freshly killed snakes only with a long-handled tool or stick; snakes can inflict fatal bites by reflex action even after their death.

CAUTION

If bitten by a snake, try to kill the snake and bring its head with you to the medical treatment facility. If you cannot bring the snake's head with you, get an accurate description of the snake to assist medical personnel in treating you. *Do not* panic!

Domestic And Wild Animals Or Birds

2-99. Service members should not try to domesticate wild animals or birds. The spread of disease from these "pets" is not worth the price the service member might pay if he or she becomes infected.

- *Do not* make "pets" of wild animals or birds.
- *Do not* handle or approach so-called "pets."
- *Do not* collect or support (feed or shelter) stray or domestic animals/birds in the unit area, unless cleared by veterinary personnel.
- Exclude such animals from your work and living areas, unless cleared by veterinary personnel first.

2-100. Many poisonous plants have thorns that can puncture the skin, introduce poison into the skin, or cause infection. (See FM 21-76.) Clothing can serve as a protective barrier for the skin. Clothing can also be a source of exposure if it is not properly cleaned after contact with poisonous plants. Toxic fruits can also cause significant harm to service member, ranging from minor wounds to rapidly fatal poisoning. The threat is magnified for US military personnel who may be unfamiliar with native species and unaware of these poisonous plants and toxic fruits.

- Avoid exposing bare skin surfaces making contact with poisonous plants by keeping sleeves down and covered.
- Avoid areas where poisonous plants grow.
- Only eat plants or parts of plants that have been approved. If you do not know, *Do not* eat it.
- *Do not* put grasses or woody twigs or stems in your mouth; they may be poisonous.

SECTION V. FOOD-/WATER-/WASTE-BORNE DISEASE/ILLNESS

2-101. Prior to deployment, the key to preventing illnesses and diseases from consumption of food and water is following the strict guidelines and procedures established by PVNTMED. During deployments, apply individual PMM.

1 Infectious diarrhea results from contamination of water and food by bacteria,
2 viruses, and parasites. Water- and foodborne diarrheal diseases are of
3 particular concern to the military because they can be spread to large numbers
4 of service member simultaneously with disastrous consequences for combat
5 readiness. Parasites (amoebas, Giardia, and tapeworms) consumed in water or
6 undercooked food, especially meat and fish, can cause prolonged illness.
7 Diarrhea, especially when vomiting or fever is present, can cause dehydration.
8

9 2-102. Fill your canteen with treated water at every chance. When treated
10 water is not available, you must disinfect the water in your canteen using one of
11 the following methods.

- 12 • Preferred method—iodine tablets:
- 13 • Fill your canteen with the cleanest water available.
- 14 • Put two iodine tablets in the canteen of water. Double these amounts
15 in the 2-quart canteen. Place the cap on canteen. Shake the canteen to
16 dissolve tablets. Wait 5 minutes. Loosen the cap and tip the canteen over
17 to one side to allow leakage around the canteen threads. Tighten the cap
18 and wait an additional 25 minutes before drinking.
- 19 • *Emergency Water Treatment Kit (CHLOR-FLOC® Tablets):*
 - 20 ▪ Tear off the top of the plastic water treatment bag at the perforation
21 (first time use).
 - 22 ▪ Fill the treatment bag one-half full with the cleanest water
23 available; add 1 tablet.
 - 24 ▪ Fold bag tightly three times and fold tabs in.
 - 25 ▪ Hold bag firmly and shake until tablet dissolves. Swirl 10 seconds.
 - 26 ▪ Let the bag sit for 4 minutes. Swirl again for 10 seconds.
 - 27 ▪ Let bag sit for an additional 15 minutes.
 - 28 ▪ Insert filter pouch in neck of canteen. Pour water from bag through
29 the filter into the canteen. Avoid pouring sediment into the filter.
 - 30 ▪ Rinse the filter with treated water after use. Always filter through
31 the sediment from treatment bag. Save the bag for water
32 treatment only. See Figure 2-8.

33
34
35 **CAUTION**

36 Do not drink from the treatment bag! The water is still
37 contaminated and must be filtered before drinking. Not
38 filtering may cause stomach and intestinal disorders.
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**FORWARD OSMOSIS WATER FILTRATION SYSTEMS
ARE AVAILABLE FOR INDIVIDUAL AND TEAM USE**

1. The single use Hydro Pack will produce up to two liters of clean drink necessary for a service member's survival from extremely turbid water (swamp scum for example). It is the simplest way for one person to stay hydrated—simply place the bag in the dirty water source and it will self-fill with clean nutrient drink. No pumping, power, or chemicals are needed. When the bag is full, simply break the sanitary wax seal and pour in to a canteen or other clean container. (NSN 4610-01-517-7017.)
2. The XPack water filtration pouch provides the same clean drinking water. Each pouch has a dirty water fill port and a drink pour spout, making it reusable system. As with the Hydro Pack, there is no clogging, no chemical additives, and no pumping. (NSN 4610-01-517-7020.)
3. The Hydro Well Expedition system provides immediate and constant hydration in a backpack hydration system. Holds up to 3 liters of clean water. (NSN 4610-01-517-2077.)
4. The Hydro Well system produces 24 liters of clean drink per day from nearly any water source. (NSN 4610-01-517-5010.)

Refer to FM 4-02.17 for more information on reverse osmosis.

Figure 2-8. Forward Osmosis Water Filtration Systems

- Household Bleach:
 - Fill your canteen with the cleanest water possible.
 - Read the label on the bleach bottle to determine amount of available chlorine. Liquid chlorine laundry bleach usually has about 5 to 6 percent available chlorine. Based upon the strength of the house hold bleach, add the chlorine to the canteen as directed in Table 2-6, (use the Pipette Dropping, 1ML, NSN 6650-010948349).
 - Place the cap on your canteen and shake. Slightly loosen the cap and tip the canteen over to allow leakage around threads. Tighten the cap and wait 30 minutes before drinking the water.

CAUTION
Ensure bleach is unscented.

Table 2-6. Drops of Household Bleach to be added to a One-Quart Canteen

Available Chlorine	Clear Water	Cold or Cloudy Water
1 percent	10	20
4-6 percent	2	4
7-10 percent	1	2

- Boiling Water
 - When chlorine or iodine is not available, bring water to a rolling boil for 5 minutes.
 - In an emergency, boiling water for just 15 seconds will help. Boiled water must be protected from recontamination.

CAUTION
If water is suspected of CBRN contamination, do not attempt to treat. Seek a quartermaster water supply point.

2-103. *Do not* buy foods, drinks, or ice from civilian vendors unless approved by veterinary personnel or PVNTMED personnel. Food, drinks, or ice should only be eaten if it is an approved food source.

CAUTION
Obtain food from approved sources ONLY.

- In emergency situations choose low-risk foods such as baked goods (breads) and thick-skinned fruits that you can peel before eating. Eat only fruits and vegetables that grow above the ground.
 - When eating in local establishments or from approved vendors, only eat hot food entrees or raw foods that you can wash and peel prior to eating.
 - Inspect all cans and food packets prior to use. Discard all cans with leaks or bulges. Discard food packets with visible holes, discolored packages, or obvious signs of deterioration or tampering. Do not taste. Do not store leftover field rations to eat later. These rations can spoil and can attract insects and rodents. (Sealed MRE components are the exception.)
 - Do not eat foods or drink beverages that have been prepared in galvanized containers (*zinc poisoning*). Canned, bottled, or vacuum-packed products should draw in air when opened (suction/hissing

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sound). If no sound is heard, or if there are any off-odors, colors, or foaming (except for carbonated beverages), discard the product. Do not taste.

- Do not eat or drink local (unapproved) ice, snow cones, open drinks with ice, or similar products; such food can cause foodborne illness/disease.
- Wash Your Hands
 - Use soap and (potable) drinking water after using the latrine, always after eating or handling any item that can potentially transfer germs. Use unscented baby wipes if potable water is not available or MRE moist towelettes.
 - Before touching eating utensils or food and frequently during the workday to keep your hands free of germs.
- Wash Your Mess Kit/Eating Utensils
 - A sure way to get diarrhea is to use a dirty mess kit or eating utensils.
 - Protect yourself by washing your mess kit/eating utensils in a mess kit laundry/sanitation center with treated water or disinfectant solution.
- Dispose Of Your Waste In An Approved Manner
 - On a march, personal disposal bags should be used first, if available. If not available, personal cat holes can be used only if your unit is on the move (refer to Appendix A)!
 - Always dispose of your waste immediately if your unit is on the move to prevent flies from spreading germs from waste to your food. Disposing of your waste also helps keep unwanted animals out of your bivouac area. Chemical toilets or burnouts are to be used in bivouac area. (See Chapter 3, Section V.)

SECTION VI. PERSONAL HYGIENE AND PHYSICAL AND MENTAL FITNESS

2-104. Physically fit, well-trained and well-led service members can succeed under the harshest circumstances. Physically fit service member are less likely to get sick or injured. Use caution when exercising in extremely hot or cold weather, heat and cold injuries can occur. Actively participating in physical fitness training assists you in becoming acclimatized to the field environment. Refer to FM 21-20 for more information on physical fitness training.

- Prevent Skin Infections.
 - Avoid bathing unnecessarily or wading in unapproved water sources (for example lakes, rivers, streams, canals). Such water can be contaminated with parasites, other disease organisms, or dangerous chemical wastes.
 - If showers or baths are not available, use a unscented baby wipes daily to wash your genital area, your armpits and your feet.
- Keep skin dry.
 - Use foot powder on your feet, especially if you have had fungal infections on your feet in the past.
 - Use talcum powder in areas where wetness is a problem (such as between the thighs, and for females, under the breasts).

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- Wear proper clothing.
 - Wear loose fitting uniforms; they allow for better ventilation. Tight fitting uniforms reduce blood circulation and ventilation.
 - Do not wear nylon or silk-type undergarments in hot or humid environments.
 - Prepare For The Field.
 - All service members need to bring toilet articles such as soap, shampoo, washcloths, towels, toothbrush, dental floss and fluoride toothpaste, and talcum powder and foot powder, with them.
 - Do not share these items. It will prevent the spreading of infections.
 - Males need a razor and blades. Females need sanitary napkins or tampons.
 - Remember, during a deployment, you may not be able to easily obtain these items if you run out; bring at least a 6-month supply.
 - Prevent Dental Disease.
 - Tooth decay and gum infections can cause severe illness if not prevented or treated early. Brush teeth and gums after meals, or at least once a day. Use fluoride toothpaste.
 - If toothpaste is not available, brush your teeth without it. Use dental floss at least once a day. Rinse your mouth with potable water after brushing and flossing; also, rinse frequently during the day when drinking water. Remember, consuming sugary food and drink requires more frequent cleaning of teeth and gums.
 - Some individuals do not drink enough fluids and tend to hold their urine due to a lack of privacy in the field. Urinary tract infections are one of the most frequent medical problems females face in the field.
 - Drinking extra fluids and urinating more often will help prevent these infections.
 - Prevent Genital And Urinary Tract Infections.
 - For males: Wash the head of your penis when washing your genitals. If uncircumcised, pull the foreskin back before washing. Protect yourself from sexually transmitted diseases (STD). Avoid sexual contact or use a condom; condoms reduce the chance of STD transmission.
 - For females: Wash your genital area daily. Do not use perfumed soaps or feminine deodorants in the field; they cause irritation and attract arthropods. Protect yourself from STD. Avoid sexual contact, or at least insist that your sex partner uses a condom—condoms help prevent STD transmission. *DO NOT* douche unless directed by medical personnel. *DO NOT* wear nylon or silk undergarments; cotton undergarments are more absorbent and allow the skin to dry.
 - Sleep When You Can.
 - Follow your leaders' instructions and share tasks with buddies so everyone gets some time to sleep safely. Sleep whenever possible. Take catnaps as the mission allows, but expect to need a few minutes to fully wake up. Sleep as much as you can *before* going on a mission that may prevent sleep. Learn and practice techniques to relax yourself quickly.
 - Only sleep in safe and/or designated areas. Never sleep in parked vehicles while the motor is running.
 - Protect against the temporary effects of sleep loss on alertness, mood, and task performance. Take short stretch breaks or get light exercise in place. *Do not trust your memory; write things down.* Get into the

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habit of writing things down that you must remember (except crucial details that might compromise the mission if they were lost or captured). Double-check your communications and calculations.

- Watch out for your mind playing tricks (seeing things that are not there) when very tired; check strange observations before acting.
- Fear and physical signs or symptoms of stress are normal reactions Before and during combat or other dangerous/life-threatening situations. You should not let fear or stress keep you from doing your job.
- Talk about what is happening with your buddies, especially during after-action debriefings. Learn ways to relax quickly. Integrate new replacements into your group and get to know them quickly. If you must join a new group, be active in establishing friendships. Give each other moral support.
- Care for your buddies and work together a team to provide everyone food, water, sleep, and shelter, and to protect against heat, cold, poor sanitation, and enemy action. Refer to FM 21-11 for first-aid procedures for stress reactions.

SECTION VII. HAZARDOUS NOISE

PROTECT YOURSELF AND YOUR MISSION FROM NOISE

2-105. Hearing protection helps reduce background noise levels so that the user can actually understand better in steady-state noise. There is also less of a tendency to flinch when firing weapons if hearing protectors are worn. Members of rifle and pistol teams are well aware that using hearing protectors can help shoot more accurately.

- Anytime you have to raise your voice to be understood within 3 feet of your listener, you are likely in hazardous steady-state noise. Put on hearing protection.
- Within 30 feet of any small arms fire is hazardous. For larger, caliber weapons, mortars, shoulder fired rockets and artillery, the need to use hearing protection could extend back several hundred feet from the firing point.
- Wear the earplug that works best for you. Different types include the triple-flange (available in three sizes), the quad-flange, the double and single-sided Combat Arms Earplug, and the silicone and foam hand-formed earplugs, which are available in one size.
- Keep earplugs clean with soap and water. Ensure they are dry when returned to carrying case.
- Check preformed earplugs at least annually for proper size and any signs of deterioration.
- Check noise muffs and helmets semi-annually for serviceable ear cup seals. Replace seals to ensure comfort and good noise reduction.
- Use the seating device built in the lid of the earplug carrying case to insert triple-flange and single-sided Combat Arms Earplugs for best results.

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- Use the Combat Arms Earplug, or the Communication Enhancement Protective System (CEPS) when firing weapons in MOUT, cave clearing or other dismounted operations requiring essential communications and situational awareness.
- Enhance communication and noise reduction under the Aviator's HGU-56/P helmet with the CEP. Use the helmet version of the CEPS when Aviator's helmet must be worn when egressing the aircraft for ground operations requiring face-to-face communication, hearing protection, retention of night vision capabilities.
- Check preformed earplugs at least annually for proper size and any signs of deterioration.
- Check noise muffs and helmets semi-annually for serviceable earcup seals.
- Replace seals to ensure comfort and good noise reduction.
- Use the seating device built in the lid of the earplug carrying case to insert triple-flange and single-sided Combat Arms Earplugs for best results (refer to Figures 2-9-2-12 below).

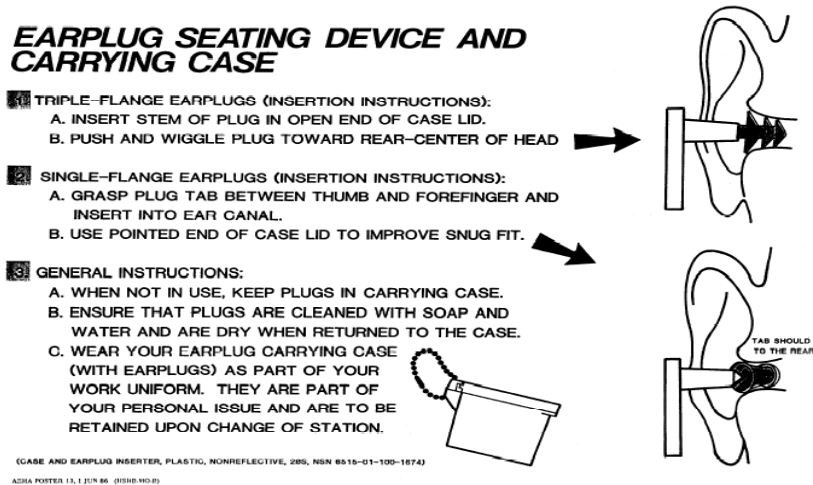


FIGURE 2-9. EARPLUG SEATING DEVICE AND CARRYING CASE

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Earplugs: General Information

1. Make the ear canal accessible by reaching over the head with opposite hand and pulling ear outward.
2. A good seal should be accomplished by a vacuum sensation (a back pressure). Also, your voice should sound muffled to you as if talking inside a barrel.
3. Plugs tend to work loose as a result of talking and chewing and must be reset.
4. Little difficulty is experienced understanding speech when plugs are worn, if the voice is raised slightly above the level of ordinary conversation.
5. Even a small leak defeats the purpose of wearing plugs.
6. Keep plugs clean with soap and water, but ensure plugs are dry when returned to case. When not in use, keep plugs in plastic carrying case provided.
7. Earplugs are part of your personal issue and are to be retained upon change of station.

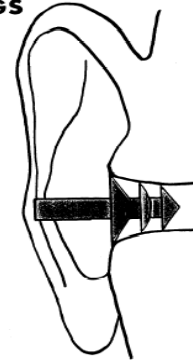


FIGURE 2-10. EARPLUGS GENERAL INFORMATION

Ⓡ

**FOR MAXIMUM PROTECTION AND COMFORT
INSERT TRIPLE FLANGE EARPLUGS
AS FOLLOWS :**

1. MAKE THE EAR CANAL ACCESSIBLE BY REACHING OVER HEAD WITH OPPOSITE HAND AND PULLING EAR OUTWARD.
2. GRASP PLUG FIRMLY BEHIND LARGEST FLANGE.
3. INSERT SMALLER FLANGE IN EAR CANAL. PUSH AND TWIST TOWARD REAR-CENTER OF HEAD.
4. IF A GOOD SEAL IS NOT OBTAINED, USE SMALLER OR LARGER SIZE. TRIPLE FLANGE PLUGS ARE AVAILABLE IN THREE SIZES- LARGE, REGULAR, AND SMALL.



FOAM EARPLUGS

FOR MAXIMUM EFFECTIVENESS AND COMFORT INSERT FOAM EARPLUGS (NSN 6515-00-137-6345) AS FOLLOWS: IMPORTANT - HANDS AND PLUGS SHOULD BE CLEAN PRIOR TO USE. DO NOT USE WHERE HAZARDOUS CHEMICALS OR MATERIALS COULD BE TRANSFERRED TO PLUG.

1 WITH BOTH HANDS GRASP THE ROUND SIDE OF THE PLUG. SLOWLY ROLL AND COMPRESS THE PLUG INTO A VERY THIN, GREASE-FREE CYLINDER.



2 WHILE COMPRESSED, INSERT THE PLUG WELL INTO THE EAR CANAL. FITTING THE PLUG IS EASIER IF THE OUTER EAR IS PULLED OUTWARD AND UPWARD DURING INSERTION.



3 WITH FINGER TIP, GENTLY HOLD THE PLUG IN PLACE UNTIL IT BEGINS TO EXPAND AND BLOCK THE NOISE. QUALITY OF FIT MAY BE ESTIMATED BY OBSERVATION.



4 EARPLUG FIT CAN BE TESTED IN THE PRESENCE OF NOISE BY ALTERNATELY COVERING AND UNCOVERING THE EAR(S) WITH TIGHTLY PRESSED HAND(S). WITH PROPERLY FITTED PLUGS THE NOISE LEVELS SHOULD SEEM NEARLY THE SAME WHETHER OR NOT THE EAR(S) ARE COVERED. KEEP PLUGS CLEAN BY WASHING IN WILD SOAP AND RINSING THOROUGHLY IN WATER. DISCARD IF DISCOLORATION OR DISFIGURATION OCCURS AFTER CLEANING.



FIGURE 2-12. FOAM EARPLUG INSERTION INSTRUCTIONS

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- Use the Combat Arms Earplug, or the CEPS when firing weapons in MOUT, cave clearing or other dismounted operations requiring essential communications and situational awareness.
- Enhance communication and noise reduction under the Aviator’s HGU 56/P helmet with the Communications Ear Plug (CEP). Use the helmet version of the CEPS when Aviator’s helmet must be worn when egressing the aircraft for ground operations requiring face-to-face communication, hearing protection, retention of night vision capabilities, etc.

2-106. Exposure to high-intensity noise may cause hearing loss that can adversely affect combat effectiveness. Noise induced hearing loss is:

- painless
- progressive
- permanent
- preventable

2-107. Noise is considered hazardous if it exceeds 85dB(A) for 8-hour time weighted average steady state noise (e.g., aircraft, vehicles), or 140dB(P) for impulse noise (e.g., weapons fire, explosions).

2-108. Signs of noise induced hearing loss include decreased hearing sensitivity, difficulty understanding conversation, and ringing in the ear called tinnitus which can be more debilitating than the hearing loss. By the time one or more of these signs is noticed, permanent damage to the inner ear has already occurred.

2-109. Hearing loss injuries usually occur slowly over time as the result of unprotected exposure to hazardous noise.

2-110. Sudden permanent hearing loss due to noise exposure can also occur as the result of acoustic trauma injury—a single exposure to a very loud short duration noise such as an explosion or firing a single round of ammunition.

2-111. Hearing protection helps reduce background noise levels so that the user can actually understand better in steady-state noise. There is also less of a tendency to flinch when firing weapons if hearing protectors are worn. Members of rifle and pistol teams are well aware that using hearing protectors can help shoot more accurately.

- Anytime you have to raise your voice to be understood within 3 feet of your listener, you are likely in hazardous steady-state noise. Put on hearing protection.
- Within 30 feet of any small arms fire is hazardous. For larger, caliber weapons, mortars, shoulder fired rockets and artillery, the need to use hearing protection could extend back several hundred feet from the firing point.
- Wear the earplug that works best for you. Different types include the triple-flange (available in three sizes), the quad-flange, the double and single-sided Combat Arms Earplug, and the silicone and foam hand-formed earplugs, which are available in one size (refer to DA Pam 40-501 for hearing protector NSN).

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- Keep earplugs clean with soap and water. Ensure they are dry when returned to carrying case. Check preformed earplugs at least annually for proper size and any signs of deterioration.
- Check noise muffs and helmets semi-annually for serviceable earcup seals. Replace seals to ensure comfort and good noise reduction.
- Use the seating device built in the lid of the earplug carrying case to insert triple-flange and single-sided Combat Arms Earplugs for best results.
- Use the Combat Arms Earplug, or the Communication Enhancement Protection Protective System (CEPS) when firing weapons in MOU, cave clearing or other dismounted operations requiring essential communications and situational awareness.
- Enhance communication and noise reduction under the Aviator’s HGU-56/P helmet with the Communications Ear Plug (CEP). Use the helmet version of the CEPS when Aviator’s helmet must be worn when egressing the aircraft for ground operations requiring face-to-face communication, hearing protection, retention of night vision capabilities, etc.
- Ensure service member receives periodic hearing checks and hearing health education training to ensure a high level of hearing readiness is maintained in the unit.



2-112. Service members should always be aware that material safety data sheets (MSDS) accompany stores of toxic chemicals when units are deployed, and they serve as an immediate reference in cases of exposure or injury. Once a unit is deployed and set up, these MSDS should be kept as part of the unit’s SOP when handling the specified chemicals/materials.

- Exhaust from engines and fuel space heaters.
- Gases from weapons firing, such as rockets and M8 smoke. When using M8 smoke in training or operations, follow unit standing operating procedures (SOPs) and leaders and controller’s instructions for use of protective masks and for moving through smoky areas, especially in buildings and tunnels.
- Solvents used to clean weapons.
- Greases and oil from vehicle maintenance repair.
- Detergents used to clean equipment.
- Industrial hazards.
- Compressed gases.
- Industrial solvents.
- Hazardous chemical waste.
- Materials used at water treatment plants.
- Materials and water used at waste sewage and water treatment plants.
- Biological/radiological hazards.
- Medical waste.
- Materials used at medical research facilities.
- Radioactive isotopes.
- Substances at nuclear power plants. Depleted uranium.

1 2-113. Recognize The Injury. Carbon monoxide is colorless, odorless, and
2 tasteless. It causes headache, sleepiness, coma, and death. Hydrogen chloride is a
3 very irritating gas that reacts with water (body fluids) to produce hydrochloric
4 acid in the throat, lungs, and eyes. It causes coughing, tissue acid burns, and flu-
5 like lung disease. M8 smoke is a very irritating gas. It can cause severe
6 coughing, wheezing, and lung damage, if inhaled. Bore/gun gases cause the same
7 effects as carbon monoxide and hydrogen chloride.
8

9 2-114. Solvents, greases, and oils cause skin rashes, burns, drying, and
10 infections. They cause damage to the liver, blood, and brain. Also, many are
11 poisons that may cause cancer. Other Medical waste causes disease. Radioactive
12 materials cause radiation illness.
13

14 2-115. Service members must protect themselves and their mission from
15 toxic industrial chemicals/ materials such as:

- 16 • Carbon monoxide.
 - 17 ▪ Run engines outdoors or with shop doors/windows open.
 - 18 Keep sleeping area windows slightly open where you sleep for
 - 19 ventilation and air movement.
 - 20 ▪ *DO NOT* sleep in vehicles with the engine running or use engine
 - 21 exhaust for heat.
 - 22 ▪ *DO NOT* park vehicles near air intakes to tents, trailers, or
 - 23 environmental control units.
- 24 • Bore/gun gases.
 - 25 ▪ Use onboard vehicle ventilation systems.
 - 26 ▪ Keep bore evacuator well maintained.
 - 27 ▪ Try to keep some air movement in gun emplacements or in protected
 - 28 batteries.
- 29 • Solvents, greases, and oils.
 - 30 ▪ Use “safety” Stoddard solvent.
 - 31 ▪ Never substitute one solvent for a “better” one; for example, never
 - 32 use benzene or fuel in place of Stoddard. Wear coveralls, if available,
 - 33 and rubber gloves.
 - 34 ▪ Wash or change clothing often, especially when soiled by chemicals or
 - 35 fuel.
 - 36 ▪ Always follow label instructions for use and safety precautions.
 - 37 ▪ Use ventilation systems in areas where fumes are present or when
 - 38 conditions and materials dictate.
- 39 • Biological Waste.
 - 40 ▪ Always use disposable rubber gloves when working with biological
 - 41 materials.
 - 42 ▪ Wear coveralls/rubberized aprons, as necessary.
 - 43 ▪ Wear goggles or safety glasses, as necessary.
 - 44 ▪ Wear facemasks and air-filtered breathing masks approved for
 - 45 specific tasks, as necessary, when removing/working with biological
 - 46 waste.
 - 47 ▪ Dispose of biological waste materials according to unit SOP and
 - 48 product label instructions.

Chapter 3

Leaders' Preventive Medicine Measures

Aside from hostile fire, the principal threats to force readiness are naturally occurring disease caused by environmental exposures. The responsibility to minimize those rests with the unit commander.

This chapter will discuss the important PMM to be employed against environments often encountered by commanders and leaders during ongoing military operations throughout the world. Commanders and leaders are charged with preventing environmental injuries to their commands and units. Commanders and leaders must remain vigilant, not only in desert climates where the environmental threats may be obvious, but also in temperate environments where the threats are more subtle, but ever present.

SECTION I - HEAT INJURIES

LEADERS PLAN FOR THE HEAT

3-1. Leaders must maximize physical fitness and heat acclimatization before deployment. They should plan to utilize their FLD SAN TM to train individuals and their leaders in PMM against heat. Members of the unit should be acclimatized to extreme temperatures as gradually as the mission will allow and be briefed on the dangers of sunburn and skin rashes and the importance of good personal field hygiene.

3-2. Commanders must be aware of the weather forecasts during those times their units are training, or as a part of a military element during ongoing operations that their unit is deployed.

3-3. Commanders must ensure adequate supplies of potable water are available (up to 3 gallons per day per service member just for drinking) (Refer to Table 3-1). They should insure that the issuing of a second canteen to each service member is part of the unit's SOP in hot weather operations. In the desert, additional canteens may be required during extended operations. Unit leaders must know the location of water distribution points in advance of operational deployment.

1 3-4. Unit leaders should set up a buddy system to maximize rehydration
2 efforts and to minimize heat injuries. Ensure medical support is available for
3 treatment of heat injuries. Plan the placement of leaders to observe for and
4 react to heat injuries in dispersed training (road marches), or operational
5 missions. If the mission permits, plan to—

- 6 • Train during the cooler morning hours.
- 7 • Serve heavy meals in the evening, rather than at noon.

8 9 **OBTAIN AND USE HEAT CONDITION INFORMATION**

10
11 3-5. Acclimatization to heat begins with the first exposure and is usually well
12 developed by the end of the first week. Individuals who are unusually
13 susceptible to heat will require additional time for acclimatization.

14
15 3-6. Full acclimatization (the ability to perform a maximum amount of
16 strenuous work in the heat) is attained more quickly by gradually increasing
17 work in the heat. Resting for 3 or 4 days in the heat, with activity limited to
18 that required for existence, results in only partial acclimatization.

19
20 3-7. Physical work in the heat must be accomplished for development of full
21 acclimatization to that work level in a given hot environment. A day or two of
22 intervening cool weather will not interfere significantly with acclimatization
23 to a hot environment.

24
25 3-8. A schedule should be established which provides for alternating work
26 and rest periods. Although advantage should be taken of the cooler hours in
27 accomplishing a portion of the work, the schedule should include gradually
28 increasing exposure during the hotter parts of the day rather than complete
29 exclusion of work at that time.

30
31 3-9. Table 3-1 provides work/rest cycles. These cycles may be modified to be
32 consistent with local conditions. The work period should be divided so that a
33 man works and rests in alternating periods. When necessary to accomplish a
34 given task, two details can be arranged to work in sequence. The schedule is
35 based on work equal to that of marching with a 20-pound pack at the rate of
36 2.5 miles per hour. Lighter work maybe carried out for longer periods of time
37 and heavier work for shorter periods.

38
39 3-10. During the midday period, personnel should rest and keep in the shade
40 as much as possible. Peak Wet Bulb Globe Temperature (WBGT) conditions
41 usually occur between 1200 and 1600 hours. Local and regional variations
42 may warrant modifications of the above schedule. Acclimatization schedules
43 for unseasoned individuals should be scaled down to their tolerance.

44
45 3-11. Adequate water must be provided at all times. Personnel cannot learn
46 to do without water. Once acclimatized, the soldier will retain his adaptation
47 for 1 week after leaving the hot environment, but if not exposed to work in
48 high temperatures, the acclimatization will then decrease at a variable rate,
49 the major portion being lost within 1 month.

50
51 3-12. Acclimatization to a hot, dry (desert) environment markedly increases
52 the ability to work in a hot, moist (jungle) environment; however, for proper
53 acclimatization to the latter, residence in such an area with regulated

1 physical activity is required. Whereas carefully and fully developed
2 acclimatization increases resistance, it does not provide complete protection
3 against ill effects of heat, especially moist heat.
4

5 3-13. Under conditions of heat stress, meals should be cool rather than hot.
6 The heaviest meal should be served in the evening rather than at noon. An
7 hour of rest following the noon meal is beneficial. This does not relieve units
8 from the responsibility of maintaining proper food service time-temperature
9 requirements for potentially hazardous foods.
10

11 3-14. The general physical condition of the individual has a significant
12 bearing on the individual's reaction to heat stress. A large number and a
13 variety of conditions may enhance individual susceptibility to heat. Among
14 these are infections, fevers, immunization reactions, heat rash, sunburn,
15 fatigue, overweight, and a previous case of heatstroke. The risk of heat injury
16 is much higher in overweight, unfit persons than in those of normal weight.
17 Special care should be exercised when such persons are exposed to high
18 temperatures. An individual once affected should, therefore, be exposed to
19 heat stress with caution. Predisposition is not developed in the case of heat
20 exhaustion and heat cramps.
21

22 3-15. Work schedules must be tailored to fit the climate, the physical
23 condition of personnel, and the military situation. Close supervision by
24 medical personnel and commanders is essential in achieving maximum work
25 output with minimum hazard. Several principles must be considered:
26 • The amount of heat produced by the body increases directly with
27 increasing work; therefore, reduction of workload markedly decreases the
28 total heat stress.
29 • Workloads and/or duration of physical exertion should be less during the
30 first days of exposure to heat and should be gradually increased to allow
31 for acclimatization.
32 • Decisions to modify work schedules must be governed by the local
33 situation; heavy work should be scheduled for the cooler hours of the day
34 such as early morning or late evening.
35 • Alternate work and rest periods may prove desirable. Under moderately
36 hot conditions, 5-minute rest periods in the shade, alternating with 25
37 minutes of work in the sun may be desirable. Under severe conditions,
38 the duration of rest periods should be increased.
39 • Exposure to high temperature at night, as well as in the daytime, will
40 decrease the amount of work that can be performed effectively.
41 • Workloads must be reduced at high temperatures when dehydration
42 resulting from excess sweating and lack of water replacement occurs.
43 • When water is in short supply, working in the early morning and late
44 evenings will allow for the accomplishment of much more work for the
45 expenditure of a given amount of water than working during the hottest
46 hours of the day.
47 • Work in the direct sun should be avoided as much as possible on hot days.
48 • Unnecessary standing at attention in the heat should be avoided because
49 continued standing places an added burden on the body's circulatory
50 system.
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- When the temperature is very high, physical work should be curtailed or, under extremely severe conditions, even suspended. The temperature at which work should be curtailed or suspended depends on the humidity, heat radiation, air movement, and character of the work, degree of acclimatization of personnel, and other factors. Heat casualties may be expected at WBGT Indices of 23.9°C (75°F) and above unless PPM is instituted. Overexertion can cause heat injury at even lower temperatures, especially if body armor or vapor impermeable protective clothing is worn (refer to Table 3-1. Individual Heat Risks).

Table 3-1. Individual Heat Risks

Identify Hazards

High heat category, especially on several sequential days (measure WBGT when ambient temperature is over 75 F)
Exert ional level of training, especially on several sequential days
Acclimatization (and other individual risk factors-see table below)
Time (length of heat exposure and recovery time)

Individual Risks for Heat Casualties (The more factors, the higher the risk)

- Not acclimatized to heat (need 10-14 days to get trainees adequately acclimated)
- Exposure to cumulative day (2-3 days) of any of the following
 - Increased heat exposure
 - Increased exert ional levels
 - Lack of quality sleep
- Poor fitness (Unable to run 2 miles in < 16 minutes)
- Overweight
- Minor illness (cold symptoms, sore throat, low grade fever, nausea, vomiting)
- Taking medications (either prescribed or over the counter) supplements/dietary aids Ex: Allergy or cold remedies. Ephedra supplement
- Use of Alcohol in the last 24 hours
- Prior history of heat illness (any heat stroke, or >2 episodes of heat exhaustion)
- Skin disorders such as heat rash and sunburn which prevent effective sweating
- Age > 40 years

3-16. Except when exposed to the sun's rays, an individual in a hot environment is better off wearing the least allowable amount of clothing. Clothing reduces the exposure of the body surface to solar radiation, but at the same time decreases the movement of air over the skin. To take full advantage of its benefits and minimize its disadvantages, clothing should be loose fitting especially at the neck, wrists, waist, and lower legs to allow air circulation. Protection from the environment also includes such simple but frequently overlooked things as marching troops over grass rather than concrete and operating in the shade, if available.

3-17. Prevention of heat casualties depends largely on the education of personnel exposed and especially upon supervision by informed leaders. Every individual exposed to high temperatures should be informed of the potentially serious results of heat injury, the general nature of these conditions, and how they can be prevented.

3-18. Supervisors must be able to identify environmental conditions under which adverse heat effects are likely to occur. They should recognize the earliest signs of heat injury and take action to prevent the development of cases. All personnel should be able to apply effective first aid. Mental confusion and over activity usually precede collapse from heatstroke.

1 3-19. Supervisors must be alert to detect this condition, enforce rest, and
2 obtain medical assistance promptly. Medical personnel should assist
3 commanders in the development of local programs for heat injury prevention.
4

5 Use Of The Wet Bulb Globe Temperature Index In The Control Of Physical 6 Activity

7
8 3-20. The WBGT serves as a guideline for making recommendations to the
9 commander when hot weather conditions are hazardous for the soldiers.
10 With this information, decisions can be made regarding soldier activity in hot
11 weather. The WBGT index can be obtained from PVNTMED or the military
12 meteorological service.
13

14 3-21. It should be emphasized that the measurements must be taken in a
15 location that is the same as, or closely approximates, the environment to
16 which personnel are exposed.

- 17 • When the WBGT index reaches 27.77°C (82°F), discretion should be
18 used in planning heavy exercise for unseasoned personnel.
- 19 • When the WBGT reaches 29.4°C (85°F), strenuous exercises, such as
20 marching at a standard cadence, should be suspended for
21 unseasoned personnel during their first 2 weeks of training. At this
22 temperature, training activities may be continued on a reduced scale
23 after the second week of training.
- 24 • Outdoor classes in the sun should be avoided when the WBGT
25 exceeds 29.4°C (85°F).
- 26 • When the WBGT reaches 31.1°C (88°F), strenuous exercise should be
27 curtailed for all recruits and other trainees with less than 12 weeks
28 training in hot weather. Hardened personnel, after having been
29 acclimatized each season, can carry on limited activity at WBGT of
30 88°F to 32.2°C (90°F) for periods not exceeding 6 hours a day.
- 31 • When the WBGT index is 32.2°C (90°F) and above, physical training
32 and strenuous exercise should be suspended for all personnel
33 (excluding essential operational commitments not for training
34 purposes, where the risk of heat casualties may be warranted).
- 35 • Wearing body armor or mission-oriented protective posture adds 10°F
36 to the measured WBGT. Limits should be adjusted appropriately.
37

38 3-22. Unit leaders should obtain heat condition information per your unit's
39 SOP or contact the local supporting PVNTMED detachment or section. Heat
40 condition may be reported as—

- 41 • Category: 1, 2, 3, 4, and/or 5.
- 42 • Wet bulb globe temperature (WBGT) index.
- 43 • Use heat condition information to determine required water intake
44 and work/rest cycles (Table 3-2).
45

46 3-23. All training activities lecture or demonstration, maintenance
47 procedures on equipment, should contain training information on personal
48 hygiene activities (such as skin and foot care) can be performed during rest
49 periods (refer to Table 3-2).
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Table 3-2.A Hot Weather Injuries and Casualties

HOT WEATHER INJURIES AND CASUALTIES

FOR THE FOLLOWING INJURIES:

SUNBURN

CAUSE	SYMPTOMS	FIRST-AID	PREVENTION
<ul style="list-style-type: none"> • Exposure of skin to direct sun • Can occur on overcast days 	<ul style="list-style-type: none"> • Red, hot skin • May blister • Moderate to severe pain • Can result in fever 	<ul style="list-style-type: none"> • Move to shade • Apply cold compresses • Apply moisturizing lotion • Hydrate with fluids • Apply analgesics for pain or fever • Do not break blisters 	<ul style="list-style-type: none"> • Adequate sun protection • Use sunscreen and apply often • Select SPF 15 or higher • Proper wear of clothing/cap

HEAT RASH (PRICKLY HEAT)

<ul style="list-style-type: none"> • Restrictive clothing • Excessive sweating • Inadequate hygiene • Causes heat intolerance if 20% of skin is affected 	<ul style="list-style-type: none"> • Red, itchy skin • Bumpy skin due to blocked pores • Moderate to severe itching • Can result in infection 	<ul style="list-style-type: none"> • Apply cold compress or immerse in cool water • Keep area affected dry • Control itching and infection with prescribed medication 	<ul style="list-style-type: none"> • Proper wear of clothing • Shower (nude) after excessive sweating
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Table 3-2.B Hot Weather Injuries and Casualties

HEAT CRAMPS

<ul style="list-style-type: none"> • Excessive loss of salt from body due to excessive sweating • Not acclimatized to hot weather 	<ul style="list-style-type: none"> • Painful skeletal muscle cramps or spasms • Mostly affects arms and legs 	<ul style="list-style-type: none"> • Replace salts • Sit quietly in shade or cool area • Massage affected muscles • Drink oral rehydration package or sports drink • Drink 0.05 to 0.1% salt solution (add ¼ of MRE salt packet to 1 quart canteen) • Get medical evacuation if cramps persist 	<ul style="list-style-type: none"> • Eat all meals to replace salt • Consume salt-supplemented beverages if adequate meals have not been consumed prior to prolonged periods of heavy sweating • Ensure adequate heat acclimatization
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Table 3-2.C Hot Weather Injuries and Casualties

HEAT EXHAUSTION

CAUSE	SYMPTOMS	FIRST-AID	PREVENTION
<ul style="list-style-type: none"> • Body fatigue and strain on heart due to overwhelming heat stress • Dehydration • Inadequate acclimatization • Inadequate physical fitness for the work task 	<ul style="list-style-type: none"> • Dizziness • Fatigue • Weakness • Headache, nausea • Unsteady walk • Rapid pulse • Shortness of breath 	<ul style="list-style-type: none"> • Initiate active cooling by best means available • Move to shade and loosen clothing • Lay flat and elevate feet • Spray/pour water on soldier and fan for cooling effect or use ice sheets around neck, arm pits and groin • Monitor with same (one) instructor • Assess soldier's mental status every few minutes • Have soldier slowly drink one full canteen (1 quart) every 30 minutes with 2 quart maximum • If not improved in 30 to 60 minutes, evacuate 	<ul style="list-style-type: none"> • Allow for Acclimatization • Monitor WBGT • Keep Soldiers in shade whenever possible • Keep soldiers in shade if possible • Follow water replacement guides • Observe work-rest cycles • Identify high risk individuals • Maintain body system • Eat all meals in garrison and field • Do not take dietary supplements • Modify uniform as ordered • Teach early recognition of symptoms • Recognize cumulative effects of sequential hot days • Reevaluate training mission if several mild heat injuries occur

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Table 3-2.D Hot Weather Injuries and Casualties

HEAT STROKE

CAUSE	SYMPTOMS	FIRST-AID	PREVENTION
<ul style="list-style-type: none"> • Prolonged exposure to high temperatures • Cumulative heat stress due to repetitive activity in hot environment • Failure of body's cooling mechanisms • Prolonged and overwhelming heat stress • Predisposing factors such as sickness, poor health or certain medications 	<ul style="list-style-type: none"> • Any of the above symptoms but more severe • Nausea, vomiting • Altered mental status with agitation confusion, delirium, disorientation • Elevated temperature usually above 104°F • Can progress to loss of consciousness, comma, and siezures 	<ul style="list-style-type: none"> • This is a medical emergency and can lead to death • Begin cooling aggressively • Body temperature that does not go below 100°F with active cooling or ANY mental status changes calls for immediate evacuation • Initiate measurs for heat exhaustion • Apply ice packs or iced sheets • Assess soldier's mental status every few minutes • If conscious, give sips of cool water while waiting for evacuation or ambulance • Do not force water into an unconscious soldier • If possible measure the soldier's body temperature • Monitor body's airway and breathing • If medic or CLS is present start intravenous (IV) fluids but limit to 500 ml NS or LR • Continue cooling process during transport (until body temperature reaches 100°F 	<ul style="list-style-type: none"> • Follow measures for heat exhaustion • Plan medical support for heat intensive operations • Ensure appropriate evacuation capabilities • Ensure Preventive • Medicine personnel and measures are in place

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Table 3-2E Hot Weather Injuries and Casualties

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ADDITIONAL MEDICAL CONSIDERATIONS IN THE HOT WEATHER ENVIRONMENT:

DEHYDRATION

CAUSE	SYMPTOMS	FIRST-AID	PREVENTION
<ul style="list-style-type: none"> • Depletion of body fluids and possibly salt 	<ul style="list-style-type: none"> • Dizziness • Weakness and fatigue • Rapid pulse 	<ul style="list-style-type: none"> • Replace lost salt and water • Water should be sipped not gulped • Get medical treatment 	<ul style="list-style-type: none"> • Follow fluid replacement guidelines • Drink 3-6 quarts of water per day • Consume full meals and drink at mealtime • Do not take dietary supplements

OVER HYDRATION (Hyponatremia)

<ul style="list-style-type: none"> • Over hydration or water intoxication • Decreased meals or dieting • Loss of body salt • Misdiagnosis and treatment for dehydration 	<ul style="list-style-type: none"> • Confusion • Weakness • Nausea, vomiting 	<ul style="list-style-type: none"> • Replace salt loss • Follow measures for heat exhaustion • If symptoms persist, evacuate 	<ul style="list-style-type: none"> • Follow fluid replacement guidelines • Replace lost salt by consuming meals and sports drinks, as directed • Do not take dietary supplements
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Table 3-3. Fluid Replacement Guidelines for Warm Weather Training
(Applies to Average Acclimated Service Member Wearing Hot Weather Uniform)

HEAT CATEGORY	WBGT INDEX DEGREES F	EASY WORK		MODERATE WORK		HARD WORK	
		WORK/REST MIN	WATER INTAKE QT/HR	WORK/REST MIN	WATER INTAKE QT/HR	WORK/REST MIN	WATER INTAKE QT/HR
1	78-81.9	NL	1/2	NL	3/4	40/20	3/4
2 (GREEN)	82-84.9	NL	1/2	50/10	3/4	30/30	1
3 (YELLOW)	85-87.9	NL	3/4	40/20	3/4	30/30	1
4 (RED)	88-89.9	NL	3/4	30/30	3/4	20/40	1
5 (BLACK)	> 90	50/10	1	20/40	1	10/50	1

The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Individual water needs will vary ± 1/4 quart/hour.

NL= no limit to work time per hour.

Rest means minimal physical activity (sitting or standing) accomplished in shade, if possible.

CAUTION: Hourly fluid intake should not exceed 1 and 1/4 quarts. Daily fluid intake **should not exceed 12 liters.** Wearing body armor adds 5° F to WBGT Index. Wearing all MOPP over garments adds 10° F to WBGT Index.

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Table 3-3. Fluid Replacement Guidelines for Warm Weather Training (Continued)
(Applies to Average Acclimated Service Member Wearing Hot Weather Uniform)

EASY WORK	MODERATE WORK	HARD WORK
WEAPON MAINTENANCE	WALKING LOOSE SAND AT 2.5 MPH, NO LOAD	WALKING HARD SURFACE AT 3.5 MPH, ≥ 40 LB LOAD
WALKING HARD SURFACE AT 2.5 MPH, ≤ 30 LB LOAD	WALKING LOOSE SAND, AT 3.5 MPH WITH LOAD	WALKING ON LOOSE SAND AT 2.5 MPH WITH LOAD
NO LOAD GUARD DUTY	WALKING HARD SURFACE AT 3.5 MPH, ≤ 40 LB LOAD	FIELD ASSAULTS CROSS-COUNTRY SKIING
MARKSMANSHIP TRAINING DRILL AND CEREMONY	CALISTHENICS, PATROLLING INDIVIDUAL MOVEMENT TECHNIQUES, SUCH AS LOW CRAWL, HIGH CRAWL DEFENSIVE POSITION CONSTRUCTION	SNOWSHOEING DOWNHILL SKIING

WARNING
Hourly fluid intake should not exceed 1 and 1/4 quarts.
Daily fluid intake should not exceed 12 liters.

Enforce Individual Preventive Medicine Measures

3-24. Leaders must–

- Enforce water intake by their units by–
 - Observing drinking required amounts. Encourage frequent drinking of water in small amounts.
 - Ensuring that practice good field hygiene.
 - Providing cool water; if desired, you can add flavoring after disinfection to enhance consumption. Personnel should use their canteen cup for consumption of flavored water. *Do not* add flavoring to canteen water; use only plain water in canteen.
 - Ensuring troops drink water before starting any hard work or mission (in the morning, with/after meals).
 - Ensuring buddy system is being used.
 - Frequently checking canteens for water; not beverages.
 - Making sure have adequate time to eat and drink as mission permits.

Permit personnel to consume carbohydrate/electrolyte beverages (sports drinks) as supplemental nutrients under conditions of extreme calorie and water requirements such as extremely vigorous activities.
- Reduce heat injuries by–
 - Enforcing the work/rest cycles when the mission permits.
 - Permitting personnel to work/rest in the shade, if possible.
 - Encouraging to eat all meals for needed salts.
 - Adjusting workload to size of individuals, when possible.

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- Being prepared for heat casualties and decreased performance when water and work/rest cycle recommendations cannot be met. (Refer to Table 3-4, 3-5 and 3-6.)

Table 3-4. Warning Signs and Symptoms of Heat Casualty and Water Intoxication
Indications of possible Heat Casualty

More Common Signs/Symptoms	Immediate Actions
Dizziness Headache Nausea Unsteady walk Weakness or fatigue Muscle cramps	Remove from training Allow casualty to rest in shade Loosen clothing While doing the above, call for a Medic to evaluate the Soldier (Medic will monitor temperature and check for mental confusion) If no medic is available, call for ambulance or Medevac
SERIOUS SIGNS/SYMP TOMS	Immediately call Medevac or ambulance for emergency transport while doing the following:
Hot body, high temperature Confusion, agitation (Mental status assessment) Vomiting Involuntary bowel movement Convulsions Weak or rapid pulse Unresponsiveness, coma	Lay person down in shade with feet elevated until Medevac or ambulance arrives Undress as much as possible Aggressively apply ice packs or ice sheets Pour cold water over casualty and fan Give sips of water while awaiting ambulance (if conscious) Monitor airway and breathing until ambulance or Medevac arrives

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Table 3-5. Indications of Possible Water Intoxication

Indications of Possible Water Intoxication (Over Hydration)

Signs and Symptoms	What to do
Confusion Weakness Vomiting	Ask these questions to the Soldier or battle buddy: Has the Soldier been eating? Check rucksack for # of MRE's left Has Soldier been drinking a lot? (Suspect water intoxication if Soldier has been constantly.) How often has Soldier urinated? (Frequent urination seen with water intoxication; infrequent urination with heat illness.) What color is urine (clear urine may indicate over hydration) If Soldier has been eating, drinking, and urinating a lot, yet has these symptoms, immediately call Medevac or ambulance for emergency transport

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Table 3-6. Mental Status Assessment

<p>Mental Status Assessment</p> <p>An important sign that the Soldier is in a serious life-threatening condition is the presence of mental confusion (with or without increased temperature). Anyone can do a mental status assessment asking some simple question.</p> <p>Call for emergency Medevac or ambulance if any of the following exist:</p> <p style="padding-left: 40px;">What is your name (Does not know their name.)</p> <p style="padding-left: 40px;">What month is it? What year is it? (Does not know the month or year)</p> <p style="padding-left: 40px;">What were you doing before you became ill? (Does not know the events that led to the present situation.)</p>
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Modify Wear Of The Uniform

3.25. It is desirable but not always possible for an individual's body to become adjusted to an environment. The service members in a unit determine the amount of time needed to adjust to an environment. Even those personnel in good physical condition need time before working or training in the extremes of climatic conditions. Climate-related injuries are largely avoidable, prevention of these types of injuries are both individual and leadership responsibility.

- Leaders must direct or authorize soldiers to—
 - Keep skin covered while in sun.
 - Keep uniform loose at neck, wrists, and lower legs (unblouse pants).
 - Keep the sleeves of their unit's service members rolled down and pants bloused in boots if the medical threat from biting arthropods is high.

Identify Special Considerations

3.26. Leaders should identify the factors that contribute to the health and well being of their unit in any environment. The leader must modify the training/physical activity/ for with high-risk conditions of heat injuries, such as—

- Diseases or injuries, especially fevers, vomiting, diarrhea, heat rash, or sunburn.
- Use of alcohol within the last 24 hours.
- Lack of recent experience in a hot environment.
- Overweight/Unit
- Over 40 Years old
- Fatigue and lack of sleep.
- Taking medication (especially for high blood pressure, colds, or diarrhea).
- Previous heatstroke or severe heat exhaustion.
- Lack of recent experience in hot environment.

SECTION II. COLD INJURIES**PLAN FOR THE COLD**

3-27. In today's political environment throughout the world, the US military will deploy to all points on the globe and these deployments may take the service members from an area with a temperate climate to one of extreme cold with very little time to adjust to these extremes. There is no way to avoid deploying to cold weather climates altogether. For that reason there are things that the leaders must be aware of if they are to prevent the harmful effects that cold has on their unit's service members.

3-28. The type of injury sustained in cold environments depends on three factors; the degree of cold to which the body is exposed, the duration of the exposure, and the environmental factors present at the time of exposure.

3-29. Cold injury can occur at both freezing and nonfreezing temperatures. Both types can be serious and if not planned for and will affect a unit's ability to continue its mission effectively. Unit leaders should—

- Use your FLD SAN TM to train individuals and their leaders in PMM against cold.
- Obtain weather forecast for time/area of training/mission.
- Ensure the following are available as the tactical situation permits:
 - Covered vehicles for troop transport, if tactical situation permits.
 - Cold weather clothing.
 - Laundry services.
 - Warming tents/areas.
 - Hot rations/hot beverages.
 - Drinking water.
- Inspect (before starting training/mission) to ensure—
 - Availability, proper fit, and wears of cold weather gear.
 - Clean, dry, proper fitting clothing.
 - Each Service Member has several pairs of socks, depending on the nature and duration of the mission.
 - Frequently rotate guards or other performing inactive duties.
 - Ensure medical support is available for treatment should cold weather injuries occur.

Determine And Use Windchill Factor

3-30. Commanders and leaders should obtain the proper cold weather gear necessary for their service members before deployment. Do not wait until the unit has its boot on the ground, or expect it will be available when they arrive at their destination.

3-31. The commander and leaders should employ the unit's FLD SAN TM members to enforce individual PMM and make recommendations regarding the implementation of your unit's PMM to them. Understanding the climatic conditions under which cold injury occurs will allow the leader to make

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informed recommendations that will, in turn, keep the service members in their unit healthy and combat ready.

- Obtain temperature and wind speed information as directed by your unit's SOP or contact the local supporting PVNTMED detachment or section.
- Calculate wind chill from Table 3-7.

3-32. Cold injuries can and do occur in nonfreezing temperatures. Hypothermia can occur in mildly cool weather.

Table 3-7 Wind Chill Chart

ESTIMATED WIND SPEED (IN MPH)	ACTUAL TEMPERATURE READING (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	EQUIVALENT CHILL TEMPERATURE (°F)											
CALM	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-28	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-48	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(WIND SPEEDS GREATER THAN 40 MPH HAVE LITTLE ADDITIONAL EFFECT.)	LITTLE DANGER IN LESS THAN ONE HOUR WITH DRY SKIN. MAXIMUM DANGER OF FALSE SENSE OF SECURITY.			INCREASING DANGER DANGER FROM FREEZING OF EXPOSED FLESH WITHIN ONE MINUTE.				GREAT DANGER FLESH MAY FREEZE WITHIN 30 SECONDS.				
	NOTE: 1. TRENCH FOOT AND IMMERSION FOOT MAY OCCUR AT ANY POINT ON THIS CHART. 2. F = 9/5 C + 32.											

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WARNING
Wet skin could significantly decrease the time for frostbite to occur.

3-33. These guidelines are generalized for worldwide use. Commanders of units with extensive extreme cold weather training and specialized equipment may opt to use less conservative guidelines.

Table 3-8. Windchill Preventive Medicine Measures

WINDCHILL	PREVENTIVE MEDICINE MEASURES
30° F AND BELOW	ALERT PERSONNEL TO THE POTENTIAL FOR COLD INJURIES.
25° F AND BELOW	LEADERS INSPECT PERSONNEL FOR WEAR OF COLD WEATHER CLOTHING. PROVIDE WARM-UP TENTS/AREAS/HOT BEVERAGES.
0° F AND BELOW	LEADERS INSPECT PERSONNEL FOR COLD INJURIES. INCREASE THE FREQUENCY OF GUARD ROTATIONS TO WARMING AREAS. DISCOURAGE SMOKING.
-10° F AND BELOW	INITIATE THE BUDDY SYSTEM—HAVE PERSONNEL CHECK EACH OTHER FOR COLD INJURIES.
-20° F AND BELOW	MODIFY OR CURTAIL ALL BUT MISSION-ESSENTIAL FIELD OPERATIONS.

- The windchill index gives the equivalent temperature of the cooling power of wind on exposed flesh.
- Any movement of air has the same effect as wind (running, riding in open vehicles, or helicopter downwash).
- Any dry clothing (mittens, scarves, masks) or material which reduces wind exposure will help protect the covered skin.
- Trench foot injuries can occur at any point on the windchill chart and—
 - Are much more likely to occur than frostbite at “LITTLE DANGER” windchill temperatures, especially on extended exercises/missions and/or in wet environments.
 - Can lead to permanent disability, just like frostbite.

IDENTIFY SPECIAL CONSIDERATIONS

3-34. Commanders and leaders should be aware of the conditions that place service members at high risk of cold injuries. They should identify the special hazards of carbon monoxide poisoning and fire that may affect your cold weather operations:

- Previous trench foot or frostbite.
- Fatigue.
- Use of alcohol.
- Significant injuries.
- Poor nutrition.
- Use of medications that cause drowsiness.
- Little previous experience in cold weather.
- Immobilized or subject to greatly reduced activity.
- Wearing wet clothing.
- Sleep deprivation.

Enforce Individual Preventive Medicine Measures

3-35. Leaders should ensure the service members wear clean and dry uniforms in loose layers and that they remove outer layer(s) before starting hard work or when in heated areas (before sweating). They should inspect the service member's socks and feet at least daily when operating in cold and/or wet environments. The individual service members should ensure that they—

- Wash their feet daily.
- Wear clean and dry socks.
- Use warming areas when available.
- Eat all meals to ensure sufficient calories are consumed to maintain body heat.
- Drink plenty of water and/or nonalcoholic fluids. In cold weather, fluid intake is often neglected, leading to dehydration.
- Exercise their big muscles or at least their toes, feet, fingers, and hands to keep warm.
- Institute the buddy system in cold weather operations, taking care of each other decreases cold injuries.

SECTION III. ARTHROPODS AND OTHER ANIMALS OF MEDICAL IMPORTANCE

PLAN FOR THE ARTHROPOD, RODENT, AND OTHER ANIMAL THREAT

3-36. Leaders should obtain information on biting and stinging arthropods and other animals (such as snakes, domestic and wild animals, or birds) that could be a threat through unit medical channels from the command PVNTMED representative. This information is also available from the health service support (HSS) annex to operation plan/order.

3-37. Commanders and unit leaders should use their FLD SAN TM to train their unit in PMM. That training must include control insects and other medically important arthropods in your AO:

- Control rodents and other medically important animals in your AO.
- Remind to avoid handling insects, arthropods, snakes, and other animals to prevent bites or injury. Animals that appear to be healthy may transmit rabies and other zoonotic diseases.
- Keep personnel from eating in sleeping/work areas; prevent attracting insects, rodents, and other animals.
- Animal mascots should not be kept or maintained unless cleared by veterinary personnel.

3-38. Commanders and leaders should also ensure that each service member has a bed net in good repair and treated with permethrin repellent; is current on all immunizations. Prophylaxis (for example, anti-malaria tablets) is available for issue as required; that laundry and bathing facilities are available. Further, commanders and leaders should ensure that the FLD SAN TM supplies and equipment are available and can be replenished.

1 Assistance from a PVNTMED detachment (through medical or command
2 channels) is contacted when control of biting arthropods, rodents, or other
3 animals is beyond the capabilities of a commander.
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5 **Enforce Individual Preventive Medicine Measures**

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7 3-39. Commanders and leaders must ensure all issued service members
8 uniforms are impregnated with permethrin before field training or
9 deployment and ensure each Service Member has DOD skin (DEET) and
10 clothing (permethrin) insect repellent and uses them as directed and needed
11 (refer to Chapter 2).
12

13 3-40. The FLD SAN TM must ensure cooks, other food handlers, and kitchen
14 police personnel do not use repellent on their hands when preparing and
15 serving food, or when cleaning food service utensils, dishes, and food serving
16 areas and ensure that the following rules are followed: kitchen personnel
17 keep their shirts buttoned, their sleeves rolled down, and their pants tucked
18 inside their boots.
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20 3-41. All kitchen workers will bathe/shower regularly (field expedients will
21 do); a field shower or bath with a clean change of uniform should be
22 accomplished once each week to control body lice, if possible. If showers are
23 not available, the workers should field bathe. They should discontinue the
24 use of aftershave lotions, colognes, perfumes, and scented soaps—they attract
25 insects. They should use permethrin treated bed nets and the DOD-approved
26 aerosol insect (Insecticide, d-Phenothrin, 2%, Aerosol, NSN 6840-01-412-
27 4634); spray inside the net if necessary.
28

29 3-42. The FLD SAN TM must ensure that workers observe taking anti-
30 malaria pills or other prophylaxis (when prescribed by the medics). The FLD
31 SAN TM can be used to identify suspected lice infestations and refer for
32 medical treatment.
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35 **Minimize Exposure To Arthropod, Rodent, And Animal Threat**

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37 3-43. If the mission conditions permit, commanders should use their FLD
38 SAN TM to assist them in selecting bivouac sites that will allow the unit to
39 occupy areas distant from insect/arthropod breeding areas such as natural
40 bodies of water. The FLD SAN TM should avoid areas with high grass or
41 dense vegetation.
42

43 3-44. Commanders should use FLD SAN TM recommendations and
44 assistance in applying pesticides for area control around living areas and in
45 natural bodies of water. The FLD SAN TM can assist in draining or filling in
46 temporary standing water sites in occupied area (empty cans, used tires, or
47 wheel ruts after rains), clear vegetation in and around occupied area,
48 maintain area sanitation by enforcing good sanitation practices, assist in
49 properly disposing of all waste and assist the commander in protecting all
50 food supplies, policing the site area regularly, excluding pests (rats, mice, lice,
51 and flies).
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SECTION IV –POISONOUS PLANTS AND TOXIC FRUIT

OBTAIN INFORMATION ON POISONOUS PLANTS AND TOXIC FRUITS THAT COULD BE A THREAT

3-45. Commanders and leaders through their unit medical channels from the command PVNTMED representative, from the HSS annex to operation plan/order use their FLD SAN TM to–

- Train your unit in PMM.
- Display and provide information on the kinds of dangerous plants and fruits in the unit area.

3-46. Commanders will enforce individual PMM by–

- Ensuring that the proper wearing of the uniform is followed by all unit service members.
- Ensuring that all service members are aware of poisonous plants where possible.
- Ensuring that all service members avoid consuming potentially dangerous vegetation and fruits and putting grasses and twigs in their mouths.

SECTION V –FOOD-/WATER-/WASTE-BORNE DISEASE/ILLNESS

PLAN FOR SAFE WATER

3-47. Commanders and leaders know the location of approved water distribution points and make sure their unit has an adequate supply of iodine water purification tablets (1 bottle for each individual), field chlorination kits, bulk chlorine, and Chlor-Floc® kits. They ensure water trailers and tankers (400 gallon and above) are inspected by PVNTMED personnel semiannually and that they inspect water containers before use, and check the residual chlorine of bulk water supplies (5-gallon cans, water pillows, water trailer) before drinking and at least daily thereafter. (See Tasks 7 and 8, Appendix A.)

PLAN FOR SAFE FOOD

3-48. Commanders and leaders will ensure food service personnel maintain foods at safe temperatures, that the food service personnel are inspected daily and that they are referred for medical evaluation if discovery of illness and/or skin infections.

3-49. Leaders will make sure foods, drinks, and ice purchased from civilian vendors are approved by the command medical authority. They will ensure that the mess kit laundry/sanitation center is supervised and that the food service personnel use handwashing devices and that all food waste is transported to an approved disposal site, buried, or burned daily (at least 30

1 meters from food preparation area and water source).
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3 **Plan For Construction And Maintenance Of Field Sanitation Devices**

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5 3-50. Commanders will allow the FLDSAN TM or a member of the
6 PVNTMED detachment to determine type of field waste disposal devices
7 required, the primary type of human waste disposal devices in field training
8 bivouac areas in are the chemical toilets. Individual waste collection bags are
9 the primary type used when on the march. During deployments overseas
10 these types of facilities and bags will not be available in most instances; the
11 type of improvised waste disposal used in those instances will depend on the
12 mission, length of stay in the area, terrain, and weather conditions.
13

14 3-51. When chemical toilets are not available, the burnout latrine is the
15 preferred improvised waste disposal device for field units in bivouac. (See
16 Appendix A for full discussion on this type of latrine.) Units must always
17 check local, state, federal, or host-nation regulations for restrictions or
18 prohibitions on using standard or improvised field devices and waste disposal
19 in the field.
20

21 3-52. The selection of locations for field latrines should be as far from food
22 operations as possible (100 meters or more). Downwind and down slope.
23 Down slope from wells, springs, streams, and other water sources (30 meters
24 or more). Set up, construct, and maintain latrines (see Task 9, Appendix A,
25 for requirements); as soon as the unit moves into a new area, detail unit to
26 set up chemical toilets or dig latrines. The unit commander or leader will
27 detail unit members to clean latrines daily.
28

29 3-53. The commander will instruct the FLD SAN TM to spray the latrines
30 with insecticide as necessary (not the pit contents) and ensure that
31 handwashing facilities are readily available at both all food service facilities
32 and all latrines, making the use of handwashing devices at latrines
33 mandatory after use.
34

35 3-54. The commander will ensure that the FLD SAN TM supervises the
36 cover, transporting, burning, and/or burying of waste daily and will use the
37 FLD SAN TM to train unit and unit leaders in PMM against food-/water-
38 /waste-borne diseases. (Refer to Appendix A for performance of tasks relating
39 to PMM against food-/water-waste-borne diseases.)
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SECTION VI. PERSONAL HYGIENE AND PHYSICAL AND MENTAL FITNESS

KEEP YOUR UNIT PHYSICALLY FIT

3-55. Leaders at all levels recognize the benefits of physical fitness; they themselves must be role models, leading by example. They must take a positive approach to physical fitness. A physically fit service member is less likely to be a combat loss from disease or injury (refer to FM 21-20 for more information).

PLAN FOR PERSONAL HYGIENE

3-56. When possible shower/bathing facilities will be provided in the field, however, that will not always be an option. Showers and baths may nothing more than a nice memory of a past life during on going operations. It is therefore, imperative that the leadership provide the opportunity and when necessary the privacy for service members to cleanse themselves. Often, that may mean nothing more than scrubbing ones vital parts with baby wipes or a washcloth and canteen full of water and a bar of soap. That may be the closest the service member gets to a bath during ongoing operations.

3-57. All personnel must bathe at least once a week and have a clean change of clothing, if possible, to reduce the health hazard associated with body lice.

3-58. The FLD SAN TM members of the unit should inspect the unit's service member's personal equipment to ensure they have sufficient personal hygiene supplies—soap, washcloths, towels, a toothbrush, dental floss, fluoride toothpaste, and razor and razor blades (females should have sanitary napkins or tampons) and baby wipes. They should ensure that the service members' undergarments are cotton (not silk, nylon, or polyester). Ensure uniforms fit properly (not tight) and that each service member has several pairs of issue boot socks; the number will depend on the type and length of the mission.

3-59. The unit leadership should use their FLD SAN TM to train their unit in personal hygiene.

3-60. The unit leadership will ensure that all members of the unit receive annual dental examinations and needed oral health care. They will ensure all oral health appointments are kept. (Commanders will use low operational requirement periods to ensure all personnel maintain a good oral health status.)

1 Enforce Sleep Discipline

2
3 3-61. The mission, unit readiness, and individual security must come first,
4 but the leadership should never miss a chance to give everyone in the unit
5 time to sleep. When feasible, set work/rest shifts. Do not allow personnel to
6 sleep in areas where they may be run over by vehicles, or in other unsafe
7 areas. During *continuous operations*, set shifts and rotate jobs to allow
8 everyone at least 3 to 4 hours uninterrupted sleep per 24-hour period.
9

10 3-62. During brief (up to 48 hours) sustained operations when shifts are
11 impossible, rotate jobs so all individuals catnap as safely and comfortably as
12 possible. The loss of sleep will reduce the Service Member's ability to
13 perform his duties and the leader's ability to make decisions. Ensure that
14 sleeping individuals observe safety precautions. Use ground guides for
15 vehicles in bivouac areas.
16

17 Enforce Preventive Medicine Measures For The Effects Of Sleep Loss

18
19 3-63. Those individuals with the most complex mental or decision-making
20 jobs need the most sleep. This means the commander and his most critical
21 leaders and operators! Cross train individuals to perform the critical tasks
22 and delegate limited authority among leaders, thus enabling all to get
23 necessary rest.
24

25 Ensure Welfare, Safety, And Health Of Unit

26
27 3-64. The leadership should ensure that the safe water, food, equipment,
28 good shelter, sanitation, and sleep possible are provided. Educate the unit to
29 maintain professional pride and personal caring for themselves, each other,
30 and their equipment.
31

32 3-65. Know the personal backgrounds and the military skills of the
33 individuals in the command. Chat with them informally about themselves. Be
34 attentive and understanding while listening to the personnel. Utilize group
35 support and counsel for personnel with *home front* problems.
36

37 3-66. Assign jobs to maintain a balance between having qualified people in
38 key positions while sharing the load, hardship, and risks fairly. Use
39 challenging and difficult environments during training to increase your own
40 and the unit's coping skills and confidence.
41

42 Reduce Uncertainty By Keeping Everyone Informed

43
44 3-67. Brief unit personnel on the situation, objectives, and conditions that the
45 mission or environment may involve. Explain reasons for hardships, delays,
46 and changes.
47

48 3-68. Do not give false reassurances. Prepare your unit for the worst and put
49 any unexpected challenges or reversals in a positive perspective. Deal with
50 rumors firmly and honestly. Prevent the spread of rumors.
51
52

1 3-69. Make contingency plans and follow SOP to reduce the effects of
2 surprise.
3

4 **Promote Cohesion Within The Unit**

5
6 3-70. Use equipment drills, physical fitness training, team sports, and field
7 *stress training* to stimulate mutual reliance and closeness. Bring unit
8 members together for meals, award ceremonies, and other special occasions.
9

10 3-71. Integrate new members by assigning sponsors and ensuring rapid
11 familiarization.
12

13 **Impart Unit Pride**

14
15 3-72. Educate your personnel in the history and tradition of the small unit,
16 its parent units, and the branch of Service. Honor the historical examples of
17 initiative, endurance, and resilience, of overcoming heavy odds, and of self-
18 sacrifice.
19

20 **SECTION VII. NOISE**

21 **PLAN FOR NOISE**

22
23
24
25
26 3-73. A commander will identify existing noise in his/her unit and if
27 necessary, request PVNTMED assistance in identifying sources and ways to
28 defuse it as much as possible. The commander will ensure that hearing
29 conservation is a part of the unit SOP. He will ensure all personnel are
30 medically fitted for hearing protectors and are issued multiple sets.
31

32 3-74. The commander will ensure all personnel have annual hearing
33 test/screening. When the unit deploys he will ensure that the unit is isolated
34 by distance; that is, keep troops away from noise, if possible and when not
35 possible he will ensure the unit is isolated by barrier (for example, use
36 sandbags) when possible. The leader will train the unit to do mission while
37 wearing hearing protectors and post "*Noise Hazard*" signs in noise hazardous
38 areas and on noise hazardous equipment when practical (refer to Chapter 2).
39

40 **Enforce Individual Protective Measures**

41
42 3-75. The leadership will ensure that all service members wear earplugs or
43 other hearing protective devices and that they do not remove inserts from
44 aircraft or tracked vehicle helmets. They will avoid unnecessary exposure to
45 noise and limit necessary exposure to short, infrequent, mission-essential
46 times.
47

48 3-76. The leadership through the FLD SAN TM will ensure that the service
49 members hearing protectors are clean and that the unit members are using
50 their safety gear.
51

1 **Protect Mission**
2

3 3-77. The leader must be aware of short-term noise effects on the service
4 member's ability to hear combat significant noise. He will assign listening
5 post (LP)/observation post (OP) to troops least affected by noise, augment
6 LP/OP with night vision devices and/or increase the number of audible
7 alarms around your position.
8

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12 **PLAN FOR CHEMICALS**
13

14
15 3-78. The commander and unit leadership will identify the sources of toxic
16 industrial chemicals/materials within his unit and if necessary, he will
17 request PVNTMED assistance in identifying sources. If possible he will
18 obtain safer chemicals for unit operations. He will ensure that his unit is
19 aware of all cautions/warnings posted in technical manuals dealing with
20 solvents corrosives and other hazardous materials. (Refer to MSDS that
21 accompany stores of toxic chemicals/materials.)
22

23
24 **ENFORCE INDIVIDUAL PREVENTIVE MEDICINE MEASURES**
25

26 3-79. The commander will ensure that the repair of the unit's engines is
27 conducted outside or will vent engine exhaust to the outside of an enclosed
28 facility.
29

30 3-80. The leader will ensure that the unit's vehicles engines are not used as a
31 source of heat for sleeping soldiers and ensure that the onboard ventilation
32 systems are maintained and in working order.
33

34 3-81. The leader will ensure that the service members in his unit are trained
35 and drilled to self-protect themselves around hydrogen chloride and M8
36 smoke and that all bore/gun gas evacuation systems are maintained in
37 working condition.
38

39 3-82. The leader will ensure that his personnel use "safety" Stoddard solvent
40 and have adequate clean gloves, coveralls, and other protective gear.
41

42 3-83. The leader will ensure that the unit's service members follow label
43 instructions on all chemical containers. **The label is the law.**

Chapter 4

UNIT FIELD SANITATION TEAM

Every company size unit across the Division is supposed to deploy with a complete inventory of field sanitation supplies as per FORSCOM Regulation 700-2. Division preventive med briefs this during its FLD SAN TM classes back at Ft. Campbell as well as site assistance visits/inspections. Division preventive medicine also conducts spot inspections to see what supplies units are missing, and during numerous pre-deployment medical briefs, they physically hand out a list outlining NSN for every piece of equipment on the FLD SAN TM list. Despite their efforts, a majority of 101st units deployed without their FLD SAN TM supplies during OIF. Field sanitation is a unit level responsibility and DIV PM ensures commanders are aware of the requirements. Division preventive medicine distributed supplies to units until their own supplies were exhausted. Good examples of high demand supplies are Blue Streak Fly Bait, DEET skin cream, Permethrin uniform treatment, and WBGT.

LESSON LEARNED DURING OPERATION IRAQI FREEDOM: Field Sanitation Team supplies at the company level, 101st ABD

As long as go as World War II, it became readily apparent that more action was needed at the unit level to counter the medical threats. To answer this need, the FLD SAN TM concept was developed. Since that time, the FLD SAN TM capabilities have expanded and once fully trained, these teams provide a significant hand in lowering DNBI in the units where they have been incorporated effectively.

The major draw back for the FLD SAN TM within the units is the lack of command emphasis. Without command emphasis the commander will fail to prevent DNBI casualties. Field Sanitation cannot be viewed as "just one more constraint" that the commander has to deal with, or worse, ignored, and placed at the bottom of his "things to do list." This chapter will discuss the FLD SAN TM, its concept, its scope, its capabilities, and the equipment the team needs to do its job.

SECTION I – THE FIELD SANITATION CONCEPT

FIELD SANITATION TEAM CONCEPT

4-1. Selected members from each company-sized unit will be designated to receive special training in DNBI prevention so they can advise the commander in PMM for DNBI. This training enables the unit commander to provide for arthropod control, individual and unit field sanitation, the

1 monitoring and securing the unit's water supplies, and ensuring the unit's
2 safe food supplies.
3

4 4-2. These comparatively few simple steps have resulted in commanders
5 being able to reduce DNBI losses and thus sustain its fighting strength.
6
7

8 **SCOPE OF FIELD SANITATION TEAM OPERATIONS** 9

10 4-3. The FLD SAN TM will conduct arthropod and rodent control operations
11 in the field as directed by the commander. In garrison, the FLD SAN TM will
12 focus on training in addition to field sanitation duties during garrison
13 operations. This will allow the FLD SAN TM to focus on their Field
14 Sanitation tasks during mobilization operations.
15

16 4-4. The FLD SAN TM will supervise the disinfection of unit's water
17 supplies and instruct the unit's troops in methods of individual water
18 purification and conducts food service operations inspections. They will
19 monitor the waste disposal procedures and the construction of garbage and
20 soakage pits; inspect these devices for proper waste disposal procedures use
21 as well as conduct noise measurement in the unit's AO.
22

23 4-5. The FLD SAN TM will ensures personnel have individual waste
24 collection bags and the unit's chemical toilets are set up and operated
25 correctly as necessary and when conditions permit their use; they will also
26 monitors disposal methods of individual bags and chemical toilet contents
27 and ensure that disposal is in accordance to unit SOP.
28

29 4-6. The FLD SAN TM will supervise the construction of field latrines and
30 urinals when chemical toilets are not available. The team is responsible for
31 inspecting these devices for proper sanitation practices within the unit.
32 (Refer to Appendix A).
33

34 4-7. The team will provides unit training in the use of individual PMM, to
35 include applying pesticides as required/necessary for the control of
36 arthropods.
37

38 **Field Sanitation Team Tasks** 39

40 4-8. The unit FLD SAN TM serves as an advisor to the commander on
41 individual and unit PMM that prevent DNBI. To assess the medical threat
42 (disease/illness risk), the team members must be able to provide for unit
43 training in the use of individual PMM; supervise the disinfection of unit
44 water supplies; instruct the troops in methods of individual water
45 purification; inspect food service operations; monitor the waste disposal
46 procedures and the construction of garbage and soakage pits; and then
47 inspect these facilities for proper waste disposal procedures used.
48

49 4-9. Additionally, the team will monitor the construction of field latrines and
50 urinals. They will also inspect these devices for proper sanitation once opened
51 for use by the unit. They will ensure soldiers are fully trained in the
52 maintenance use and procedures for disposing of human wastes (refer to
53 Appendix A).

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4-10. Additional FLD SAN TM tasks include inspecting the units water containers and trailers, (Use DA Form 5456-R and DA 5457-R refer to Appendix A.); and to disinfect the unit's water supplies as well as check the unit's water supply for chlorine (refer to Appendix A) and monitor the status of PMM in unit. They may assist in selection of a unit's bivouac site, as well as conducting hazardous noise measurements. The team also controls arthropods, rodents, and other animals in unit area. Pesticides will be used only when warranted, and a team member will apply under the guidance of a certified pesticide applicator (refer to Appendix A).

12 Selection Of Personnel

13
14
15
4-11. Army regulation 40-5 specifies that the selection of personnel for the unit FLD SAN TM should be based on the following:

- 16 • Units having organic medical personnel (combat medics) *WILL* use them as part of the FLD SAN TM.
- 17 • When organic medical personnel are not available, selected team members should be personnel whose normal field duties allow them to devote time to field sanitation activities.
- 18 • At least one member *must* be a noncommissioned officer when organic medical personnel are not available.
- 19 • Soldiers selected for the FLD SAN TM should have at least six months remaining in the unit. Ensure replacement FLN SAN TM members are trained prior to team members rotating.

20 21 22 23 24 25 26 27 28 29 30 SECTION II TRAINING THE FIELD SANITATION TEAM

31 TRAINING

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34
35
4-12. The members of the FLD SAN TM are required to receive training in basic sanitation techniques, disease control, and individual PMM. This training includes:

- 36 • Use of insect repellents, uniform impregnates, and protective clothing.
 - 37 • Use and repair of screening and bed nets.
 - 38 • Use of residual and space insecticide sprays.
 - 39 • Rodent control measures.
 - 40 • Food service sanitation.
 - 41 • Unit waste disposal procedures.
 - 42 • Water purification procedures that include the determination of chlorine residual in the unit's water supply.
 - 43 • Personal hygiene.
 - 44 • Heat/cold injury prevention, to include WBGT determination and use of the wind chill chart (Refer to Chapter 3).
 - 45 • Sound level measurement.
 - 46 • Appropriate fit and selection of hearing protective devices.
- 47
48
49

1 **A Standard Unit Field Sanitation Team Equipment Set List**

2
3 4-13. Army Regulation 40-5, *Preventive Medicine*, requires a company, a
4 troop, and battery-sized units that deploy to the field, appoint a FLD SAN
5 TM. A unit's FLD SAN TM should maintain the equipment and supplies
6 listed in Table 4-1.
7

8 4-14. These PVNTMED materials are to be used in support of a unit's
9 training exercises as well as in support of real-world missions. The old adage
10 that states that a unit fights the same way it trains is also true for a unit's
11 FLD SAN TM.
12

13 4-15. If a unit takes field sanitation seriously during training exercises, it
14 will be much more likely to know how to survive when necessary in a real-
15 world situation.
16

17 4-16. Commanders and leaders should incorporate the FLD SAN TM on all
18 training missions and ensure all supplies and equipment is available for
19 deployment.
20

21 4-17. Ideally, the Infantry Center and School should manage this set under
22 the Soldier Enhancement Program (SEP) to place the emphasis of the
23 program on the soldier, and the unit's leadership. The standard set for the
24 unit FLD SAN TM is listed as a CTA 50-970 item. This set may be purchased
25 and maintained by units just as with all CTA equipment. The set is to be
26 reported on the USR and the equipment set is accountable in a unit's
27 property book.
28

29 4-18. The development of a line item number (LIN) set for the Unit FLD
30 SAN TM is essential. The LIN item for the set is reported on the Unit Status
31 Report (USR) and is accountable under the command supply discipline
32 program.
33
34
35

36 **CAUTION**

37
38 Do not store the FLD SAN TM equipment set in a
39 CONEX, it must remain with the unit FLD SAN TM at all
40 times when in transit and/or deployment.
41
42

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Table B-1. Field Sanitation Team Expendable Materials.

ITEM	NSN	Unit/Issue	Allowance
Alcohol Swabs, SGL Pads, 500	6510-01-153-4638	BX	1/150 individual
Calcium Hypochlorite 6 oz jar (See Note 1)	6810-00-255-0471	BT	1/50 individual
Chest, #3, 30x18x10 Aluminum (See Note 2)	6545-00-914-3480	EA	As Required to move stored items
Chlorination Kit, Water Purification	6850-00-270-6225	KT	1/15 individual
Or			
Chlorination Kit, Water	6850-01-374-9921	KT	1/15 individual
Chlorine Test Tablets DPD #1 (100 tablets)	6550-01-044-0315	PG	1/team
Container, Bait, Rodent (UI contains 6 bait stations)	3740-01-423-0737	BX	1/team
Disinfectant, Food Service (U/I contains 12 packets)	6840-00-810-6396	BX	1/75 individual
Gloves, Chemical and Oil Protective (size 9)	8415-01-012-9294	PR	2/150 individual
Or			
Gloves, Chemical and Oil Protective (size 11)	8415-01-013-7384	PR	2/150 individual
Surgical Gloves Disposable	6515-01-150-2978	BX	1/team
Goggles, Industrial Non-vented	4240-00-190-6432	EA	2/150 individual
Insect Repellent, Personal Application, 2 oz tube (UI contains 12 tubes)	6840-01-284-3982	BX	4 tubes/individual
Insect Repellent, Clothing Application IDA Kit (UI contains 12 kits)	6840-01-345-0237	BX	4 Kits/individual
Insect Repellent, Clothing & bednet Treatment, Aerosol, 6 oz can (UI contains 12 cans)	6840-01-278-1336	BX	1 can/individual
Insecticide, Chlorpyrifos 42%, Unit Dose 40 ml btl (Dursban LO) (UI contains 12 BTL)	6840-01-210-3392	BX	1/150 individual
Or			
Insecticide, Demand Pestab10% Tablets, Unit Dose (UI contains 40 Tablets) (See Note 3)	6840-01-431-3357	CO	1/150 individual
Insecticide, d-Phenothrin 2%, Aerosol, 12 oz	6840-01-412-4634	CN	1/individual
Mouse Trap, Spring Indv (UI contains 12 traps)	3740-00-252-3384	DZ	4dz/150individual
Rat Trap, Spring (UI contains 12 traps)	3740-00-260-1398	DZ	4dz/150individual
Rodenticidal Bait Anticoagulant, 0.005% diphacinone 40 blocks per box	6840-00-089-4664	BX	1/150 individual
Rodenticide Bait Anticoagulant, 0.005% brodifacoum (Talon-G) 11 lb. Can	6840-01-426-4808	CN	1/150 individual
Or			

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Table B-1. Field Sanitation Team Expendable Materials (Continued).

Rodenticidal Bait Anticoagulant, 0.005% bromadiolone, (Maki Pellets) 11 lb. Can (See Note 4)	6840-01-151-4884	CN	1/150 individual
Sprayer, Insecticide, Manually Carried, 2-Gal	3740-00-641-4719	EA	1/150 individual
Or			
Sprayer, Insecticide, Manually Carried, 1-Gal (See Notes 5 & 6)	3740-00-191-3677	EA	1/150 individual
Trunk, Locker; Plywood	8460-00-243-3234	EA	3/team
Book Record Ledger Double Entry	7530-00-286-6211	EA	1/team
Spoon Measuring Plastic (0.5g)	6640-01-070-7877	EA	1/team
Swatter, Fly (UI contains 12 fly swatters)	3740-00-252-3383	DZ	1/150 individual
Test Paper, Chlorine Residual (UI is package of 10)	6630-01-012-4093	PG	1/team
Thermometer, Food	6685-00-444-6500	EA	2/team
Water Purification Tablet, Chlorine (UI contains 10 tablets)	6850-01-352-6129	PG	10/individual
Or			
Water Purification Tab 50s, Iodine, 8 MG (UI contains 50 tablets)	6850-00-985-7166	BT	2/individual
Test Strips, ph & CL	6640-NCM-02-1025	PG	1/team
Wet Bulb-Globe Temperature (WBGT) Kit (without tripod) (See Note 7)	6665-00-159-2218	EA	1/unit
Or			
Wet Bulb-Globe Temperature (WBGT) Kit (with tripod) (See Note 7)	6665-01-381-3023	EA	1/unit
Wet Bulb-Globe Temperature (WBGT) Black Globe Thermometer (Replacement part)	6685-01-110-4429	EA	1/team
Wet Bulb-Globe Temperature (WBGT) Wet Bulb Thermometer (Replacement part)	6685-01-110-4430	EA	1/team
Wet Bulb-Globe Temperature (WBGT) Dry Bulb Thermometer (Replacement part)	6685-01-110-6563	EA	1/team
Wet Bulb-Globe Temperature (WBGT) Wick (Replacement part) (See Notes 7 & 8)	Part # 5180-0001	EA	1/team
Wet Bulb-Globe Temperature (WBGT) Calculator Wet Bulb (Moveable Scales)	6665-01-109-3246	EA	As Needed
Ball Point Pen MED	7520-01-058-9978	DZ	As Needed

Legend: BTL—bottle BX—box CN—can DZ—dozen EA—each GA—gauge KT—kit lb.—pound
ml—milliliter PG—package U/I—unit of issue TABS—tablets IND—individual GAL—gallon SGL—surgical
NSN—National Stock Number BTL—bottles

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NOTE 1: Store Calcium Hypochlorite separately from organic materials in individually packed plastic zip lock bags. Place individually packed zip lock bags into a serviceable ammunition can marked with Department Of Transportation (DOT) Oxidizer labels.

1
2 **NOTE 2:** Units may store FLD SAN TM materials (except NSN 6810-00-255-0471, Calcium Hypochlorite, unless
3 packed in a serviceable ammunition can) in a sealed metal chest or in a footlocker. Whenever possible, keep all
4 materials in their original packaging. If removed from the original package, package the materials into a fiberboard
5 or plywood box and then place them into the sealed metal chest or footlocker.
6

7 **NOTE 3:** Demand Pestab replaces Insecticide, Chlorpyrifos (Dursban LO, NSN 6840-01-210-3392). Use Dursban
8 LO until stocks depleted.
9

10 **NOTE 4: Do not prestock Talon-G or Maki because of short shelf life.** Order on a priority basis prior to
11 anticipated deployment. For emergency procurement: Contact the Defense Supply Center, Richmond (DGSCR)
12 Emergency Supply Operations Center (ESOC) at DSN 695-4865 [commercial (804) 279-4865]. This ESOC is
13 staffed 24 hours, 7 days per week.
14

15 **NOTE 5:** Obtain three sets of repair parts for each sprayer. Repair parts include items such as: check valves,
16 pressure cups, filters, O-rings, and four way nozzles with crack and crevice tips. Order repair parts from the sprayer
17 manufacturer by part number as Class IX repair parts.
18

19 **NOTE 6:** If all sprayers are not equipped with a pressure gauge, order a pressure gauge, NSN 3740-01-332-8746,
20 and filter, NSN 4330-01-332-1639, to retrofit the sprayers.
21

22 **NOTE 7:** WGBT Kit replacement Wick (Part Number 5180-0001), Water Reservoir (Part Number 6013-0145), and
23 Black Globe Analog (Round piece that fits over black thermometer) (Part Number 6013-0142), can be purchased
24 from Sigma Products, South Carolina, 1-800-215-0440 (Ms. Cramer). NSN assignment and Armed Forces
25 Management Board review pending.
26

27 **NOTE 8:** Cotton shoestring may be used for wick replacement.
28
29

30 **How To Make Your Field Sanitation Team The Best In The Command**

31
32 4-16. Commanders should select soldiers you can rely on. After they are trained,
33 use them during service training and evaluation programs, field training
34 exercises, unit training on PMM, predeployment training on the medical threat in
35 the deployment AO.
36

37 4-17. Commanders must ensure that their unit has a functional FLD SAN TM
38 SOP (refer to Appendix D).

Appendix A

UNIT-LEVEL FIELD SANITATION TEAM TASKS

SECTION I – BASIC TASKS

TASK 1: Control Biting Insects Using A 1-Gallon Compressed Air Sraayer

EQUIPMENT NEEDED:

- 1-gallon sprayer (NSN 3740-00-191-3677)
- Ready-to-use insecticide (NSN 6840-01-431-3357),
- Insecticide, d-Phenothrin 2% (NSN 6849-01-412-4634)
- Chemical protective gloves (NSN 8415-01-012-9294 and NSN 8415-01-012-7384)
- Non-vented goggles (NSN 4240-00-190-6432)
- Fly swatter (NSN 3740-00-252-3833)
- Field Manual (NSN 7530-00-286-6211)
- Writing material (7520-01-058-9978)

CAUTION

Only personnel certified as DOD Pesticide Applicator may apply pesticides. Uncertified persons may apply pesticides if they are properly trained by and under the direct supervision of a certified pesticide applicator.

STEPS OF PERFORMANCE:

STEP 1: Determine the job to be done (pest, area to be treated, and pesticide type).

STEP 2: Assemble the compressed air sprayer. Select the correct nozzle and attach to the end of the wand, fill the tank half full of clean water, and pressurize the tank to ensure that the tank and nozzle are operational. Pressurize to approximately 40 to 60 pounds per square inch (psi) of pressure. If the sprayer does not have a gauge, approximately 30 to 35 pump strokes will usually be sufficient. Squeeze the handle on the wand to check nozzle performance. If the sprayer leaks, replace the gaskets or tighten the connections on the hose, wand, and nozzle.

STEP 3: Read the insecticide label.

- Always read the label before doing anything.
- Always follow all instructions on the label. *The label is the law.*

CAUTION

Wear chemical resistant gloves during mixing and spraying. Gloves, Chemical and Oil Protective, NSN 8415-01-012-9294 (size 9) or NSN 8415-01-013-7832 (size 10) are recommended. Wear an approved pesticide respirator, if required by the label. DO NOT use the NBC protective mask when applying pesticides. Avoid skin contact with insecticide.

STEP 4: Add pesticide to the clean water in the sprayer tank. Finish filling the sprayer with clean water to the appropriate level. **DO NOT fill the sprayer to the top.** Leave space for pumping air pressure into the tank. Put the pump assembly into the sprayer and tighten.

STEP 5: Pump the sprayer.

- Pump the sprayer 30 to 35 times to achieve 40 to 60 psi pressure.
- There should be a slight resistance to pumping when this pressure is achieved.
DO NOT over pump.

IDENTIFICATION AND CONTROL OF:

MOSQUITOES:

STEP 1: Identify common mosquito-breeding areas:

- Mosquito landing counts and trapping.
- Standing water.
- Artificial water containers.

STEP 2: Control:

- If possible, drain standing water.
- Empty artificial water containers.
- Avoid setting up bivouac sites near mosquito-breeding areas.
- Enforce individual use of DOD insect repellent systems (DEET on skin and permethrin on uniforms and bed nets).
- Have FLD SAN TM spray pesticide on adult mosquito-resting areas using
- 1-gallon sprayer (see Task 2), if necessary.

FLEAS:

STEP 1: Identify rodent infestations or the presence of wild or domestic cats and dogs in the unit area (rodents, cats, and dogs carry fleas).

STEP 2: Control:

- Have service members in unit use individual DOD insect repellents.
- Exclude rodents and other wild animals from camps and buildings.
- Have FLD SAN TM spray pesticide, using 1-gallon sprayer (see Task 2) around rodent burrows and harborage.
- **DO NOT** allow service members to keep “pet” animals.

LICE:

STEP 1: Identify lice infestation:

- Head lice—look for lice and eggs attached to the hair, close to the scalp. Eggs are attached directly to the hairs.
- Crab lice—usually associated with the pubic area (groin), but can be found attached to other body hairs. The eggs are attached directly to the hair.
- Body lice—generally found in the seams of infested persons' clothing.
- The eggs are attached to the fibers of the garments. Body lice tend to move to the body of the host only during the actual feeding process.

STEP 2: Control:

- Refer individuals with lice infestation for medical treatment.
- Enforce high standards of personal hygiene. Require frequent showering and laundering of bedding and clothing (once a week at a minimum).
- To prevent body lice, enforce individual use of permethrin-treated battle dress uniform/cammies.
- Avoid sexual contact (for crab lice).

TICKS AND MITES:

STEP 1: Identify tick- or mite-infested areas—

- Grassy areas
- Animal trails or resting areas.
- Rodent burrows.

STEP 2: Control:

- Avoid walking through tick-infested areas.
- Cut down vegetation in and around camps.
- Enforce individual use of DOD insect repellent.
- If necessary, have FLD SAN TM spray area with pesticide, using 1-gallon or sprayer to apply pesticide (see Task 2).
- Enforce a buddy system where troops perform checks not only on themselves but on their buddy as well. If ticks are found—
- Remove any attached ticks promptly and carefully without crushing, using gentle steady traction with forceps (tweezers) close to the skin to avoid leaving mouthparts in the skin;
- Protect hands with gloves, cloth or tissue when removing ticks from humans or animals;
- Ensure that the body of the tick is not separated from its head.

CAUTION

Lyme disease, Rocky Mountain spotted fever, ehrlichiosis, and encephalitis can be contracted through tick bites. Beware of ticks when passing through the thick vegetation they may cling to. When cleaning host animals for food, or when gathering natural materials to construct a shelter, you must be on the lookout for them. Buddy checks are important. If diagnosed early, the diseases mentioned above can be cured. If not, they can lead to death.

BITING FLIES:

STEP 1: Identify problems with biting flies and their breeding sites.

- Moist soil near ponds and stream banks.
- Decaying vegetation and animal manure.
- Rodent burrows, rock walls, and cracks in walls of buildings.

STEP 2: Control:

- Enforce use of DOD insect/arthropod repellents (DEET on the skin and permethrin on uniforms).
- Avoid areas with biting fly problems or breeding sites.

FILTH FLIES:

STEP 1: Identify infestations and breeding areas, such as—

- Open latrines.
- Uncovered food and waste.
- Ground soaked with liquid kitchen waste or food scraps on wet soil.
- Animal barnyards near AO.

STEP 2: Control:

- Remove, cover, or burn latrine waste.
- Keep food and waste covered.
- Use fly swatters for small to moderate numbers of filth flies. Only use the DOD-approved aerosol (Insecticide, d-Phenothrin, 2%, 12 ounce Aerosol, NSN 6840-01-412-4634) pesticide if large numbers of flies are in an enclosed area (do not use in food service operations).
- Ensure proper disposal of waste collection bags.
- Have FLD SAN TM use a 1-gallon or sprayer to spray pesticide on ground that is wet with kitchen waste, in field latrines, and on fly-resting sites (see Task 2).
- Use toxic fly baits.

COCKROACHES:

STEP 1: Identify cockroach infestations and breeding areas, such as—

- Food service areas.
- Latrines/shower facilities.
- Trash collection points.

STEP 2: Control:

- Enforce good sanitation practices.
- Ensure proper collection and removal of food waste.
- Have FLD SAN TM use a 1-gallon or sprayer to spray pesticide as spot treatment in food service areas and as a residual spray to outside surfaces of buildings and trash collection points.

SPIDERS:

STEP 1: Identify infestations of medically important spiders (black widow, tarantula, and brown recluse spider).

CAUTION

Use caution when entering into and the clearing out of old, infrequently used buildings.

STEP 2: Control:

- Eliminate unnecessary rubbish and other debris in the bivouac area.
- Have FLD SAN TM use a 1-gallon or sprayer (see Task 2) to spray around tents, field latrines, or other spider habitats.

SCORPIONS AND CENTIPEDES:

STEP 1: Identify places where scorpions and centipedes are a problem.

- Rocky areas.
- Inside of building.
- Tents.

STEP 2: Control:

- Have FLD SAN TM use a 1-gallon or sprayer (see Task 2) on nesting sites around the entire tent or other structure, forming a band 2-feet high from the ground level.
- Saturate all cracks and crevices with insecticide.

BEEES, WASPS, AND ANTS:

STEP 1: Identify places where these insects are a problem. Locate the nests.

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- STEP 2: Control:**
- Educate troops to avoid nests.
 - Have FLD SAN TM use a 1-gallon or sprayer (see Task 2) on the nesting sites. Use caution to avoid stings from disturbed insects. If the task is too great or too dangerous, contact PVNTMED personnel for assistance.

- STEP 3: Spray insecticide.**
- Point nozzle at area to be sprayed and squeeze the handle on the wand.
 - Continue spraying until area is covered.
 - Record all pesticide applications. The record should include location of application, name of pesticide used, and amount of pesticide used. Pesticide applications must be reported to higher echelon command, using

Department of Defense Form 1532-1 as required by DOD Instruction 4150.7.

- STEP 4: Clean the sprayer.**
- Release pressure from tank and dispose of any unused pesticides.
 - Clean the sprayer with soap and water, then flush the tank at least 3 times with clear water.
 - Rinse all parts in clear water.
 - Reassemble and spray clear water through nozzle. If the sprayer is not cleaned after use, vital parts will corrode.

- STEP 5: Store cleaned sprayer.**
- Turn the sprayer tank upside down with pump assembly separated to keep tank dry.

CAUTION

Always wash your hands and chemical resistant gloves, respirator, goggles, and other personal protective equipment with soap and water after spraying. Store personal protective equipment away from pesticides and applicator.

TASK 2: Control Domestic Rodents.

EQUIPMENT NEEDED:

- Rat snap trap (mechanical spring) (NSN3740-00-260-1398)
- Mouse snap trap (mechanical spring) (NSN 3740-00-252-3384)
- Field Manual (NSN 7530-00-286-6211)

STEPS OF PERFORMANCE:

- STEP 1: Identify** rodent infestations and breeding and harborage areas, such as—
- Underground burrows.
 - Around building foundations.
 - Under rubbish piles.
 - Near food sources.

STEP 2: Control:

- Enforce food sanitation practices, such as eliminating garbage and food waste in the bivouac area and keeping all food and waste covered.
- Locate trash dumps away from sleeping/berthing and food service areas.
- Clear all possible nesting areas by removing unnecessary rubbish and other debris.
- Modify buildings and structures to prevent rodents from having easy access.
- Use rodent snap traps and poison baits simultaneously for effective control.
- Poison baits must be placed in tamper/spill-proof containers with bilingual labels (English and local). Read the label and wear chemical resistant gloves when handling poison baits.

CAUTION

Wear chemical resistant gloves while handling rodenticides. Avoid skin contact with rodenticides. Wear plastic gloves when handling dead rodents. Place dead rodents in plastic bags; seal and dispose of the bags in landfills, or incinerate.

TASK 3: Prevent Injuries Due To Venomous Snakebite.

EQUIPMENT NEED

- Rat snap trap (mechanical) (NSN 3740-00-260-1398)
- Mouse snap trap (mechanical) (NSN 3740-00-252-3384)
- Field Book (NSN 7530-00-286-6211)
- Writing Material (7520-01-058-9978)

STEPS OF PERFORMANCE:

STEP 1: Be familiar with venomous snakes in the AO and with areas where snakes may be a problem.

- Rocky areas.
- Areas with rodent infestations.
- Heavy vegetation.

STEP 2: Control:

- Be familiar with field treatment of snakebites.
- Educate personnel on avoiding snakes and preventing snakebites.
- Prevent and control rodents (food sources for snakes) around camps and bivouac sites.
- Exclude snakes from buildings.

TASK 4: Inspect Unit Food Service Operations.

EQUIPMENT NEEDED:

- Thermometer, Self-Indicating Bimetallic, 0° F to 220° F, (NSN 6685-00-444-6500).
- Alcohol Pads (NSN 6510-00-786-3736)
- Disposable Gloves (NSN 6515-01-150-2978)

- Test Paper, Food SVC (NSN 6630-01-012-4093)
- Field Manual (NSN 7530-00-286-6211)
- Writing material (7520-01-058-9978)

BACKGROUND INFORMATION:

Some foods support the rapid growth of disease organisms that cause diarrhea; these foods are called:

POTENTIALLY HAZARDOUS FOODS

Examples of potentially hazardous foods include but are not limited to meats, fish, milk, creamed beef, gravies, soups, and chicken. Extra care and precautions must be taken with these potentially hazardous foods. Five factors most often involved in outbreaks of diarrhea caused by contaminated foods are—

Failing to keep potentially hazardous foods cold (below 40° F) or hot (above 140° F) allowing potentially hazardous foods to remain at warm temperatures (41° F to 139° F).

- Failing to thoroughly cook potentially hazardous foods (PHF). In a field environment, the minimum cooking temperature for PHF is 165° F.
- Preparing foods 4 hours or more before being served.
- Allowing sick employees to work.
- Permitting poor personal hygiene or sanitation practices by food handlers.
- Example: Not washing hands after using the latrine; improperly washing and sanitizing all cooking utensils. Food service personnel must remove camouflage paints from hands, forearms, and face before handling, or servicing food, or cleaning food contact surfaces, and equipment.

STEPS OF PERFORMANCE:

IN GARRISON OR WHEN FOOD IS PREPARED IN A FIELD FOOD SERVICE FACILITY:

STEP 1: Have the supervisor check the temperature of potentially hazardous foods.

- If hot food should be 140° F or above.
- If cold food should be 40° F or below.

STEP 2: Check personnel for illness and skin infection.

STEP 3: Check food handling techniques and personal hygiene.

STEP 4: Have the supervisor check the food temperature in cold storage units.

STEP 5: Check hand-washing facilities. Are the facilities being used by food Handlers?

STEP 6: Check doors and windows. Are they closed or screened to prevent flies from entering? See FM 10-23 and TBMED 530 for the correct operating procedures for a field kitchen facility (mobile field kitchen [MKT-75] or kitchen tent [M-1948]).

WHEN FOOD IS BROUGHT TO YOUR UNIT IN THE FIELD:

STEP 1: Check the preparation of insulated containers.

- For hot foods, the container should be preheated by the use of Boiling water. Foods should be placed in the container while they are

1 hot (above 140° F).

- 2 • For cold foods, the container should be pre-chilled by the use of ice.
3 Foods placed in the container should be cooler than 40° F. Always
4 check the container and the insert seals to ensure that they are
5 intact and in good condition to aid in keeping food at it's required
6 temperature. See FM 8-34 and FM 10-23 for the correct procedures
7 for preparing the insulated containers.
8
- 9 • Mark the containers with the common name of the food, the time and temperature
10 when the container was loaded. The food must be consumed within 4 hours from the
11 date/time on the food container or the last time the temperature of the food was
12 taken and at safe temperature.
13

14 **STEP 2:** When the insulated container arrives, the supervisor must check the
15 food temperature before serving. Make sure it is 140° F or above for hot
16 foods and 40° F or below for cold foods. If the temperature is in the
17 danger zone, contact the medical authority for instructions.
18

19 **STEP 3:** Check for handwashing devices for use by service members.
20

21 **STEP 4:** Check the mess kit laundry, if used. Make sure service members are
22 using the mess kit laundry correctly. The food waste is placed in a scrap
23 can. Wash the kit in warm, soapy water (120° F to 140° F) using a long-handled
24 brush to scrub. Rinse the mess kit in clear, boiling water. Disinfect the mess kit by
25 immersing it in clear, boiling water for 10 seconds. Each mess kit laundry setup of
26 four cans will support 80 personnel. Air-dry the mess kits. If a sanitation center or
27 immersion heaters are not available, food service disinfectant may be used. Make
28 sure the label directions are being followed. Each setup of four cans will support 100
29 personnel. The setup consists of one can for food scraps, one can with soapy water, a
30 clear rinse can, and a final rinse can with food service disinfectant.
31

32 **STEP 5:** Check the sanitation center, if used. The sanitation center is a set of one
33 garbage can and three sinks with the M2 field range burners, or the modern burner
34 unit, and thermometers. The first sink has warm, soapy water. The second sink has
35 clear, 170° F water. The third sink has clear, 180° F water. If thermometers are not
36 available, the third sink must have boiling water. Food is scraped into the garbage
37 can. Scrub mess kit in the warm, soapy water by using a long-handled brush. Rinse
38 the mess kit in the second sink of clear, 170° F water. Disinfect the mess kit by
39 immersing it in the third sink of 180° F water for 10 seconds. Air-dry the mess kits.
40

41 **TASK 5: Inspect Water Containers.**

42 **EQUIPMENT NEEDED:**

- 43
- 44 • Field Manual (NSN 7530-00-286-6211)
 - 45 • Writing material (NSN 7520-01-058-9978)
- 46

47 **WHEN TO INSPECT WATER CONTAINERS:**

- 48
- 49 • Quarterly in garrison when not being used.
 - 50 • Prior to deployment.
 - 51 • Before filling at water distribution points.
 - 52 • Upon completion of use to ensure that all water has been drained from the container
53 before storage.

STEPS OF PERFORMANCE:

UNIT WATER TRAILER:

- Upon completion of use:

STEP 1: Drain plug and spigots: Make sure that the drain plug has been removed and that all spigots have been opened to drain all water from the tank. Foul odors, bacteria growth, and rust will accumulate during storage if the water is not completely drained.

STEP 2: Manhole cover: Place a thin piece of wood under the manhole cover to provide ventilation. With the manhole cover and spigots open, air circulation will be allowed, thus drying the inside of the water trailer.
(See the technical manual on your water trailer for additional guidance.)

- Quarterly:

STEP 1: Manhole cover: Ensure the sealing gasket is in place, free of excessive cracks and dry rot. Cover should provide an effective seal.

STEP 2: Drain plug: Ensure it is operable; it should be removable without excessive effort.

STEP 3: Interior: Check surface for excessive cracks; check for signs of being used for storage of products other than water such as oil products, common natural chemicals in water (iron or manganese) pose no health should open and close with ease. Spigot handles should operate freely.

CAUTION

Questions that concern excessive interior cracks, chipping or staining, and use after storage of products other than water should be directed to PVNTMED personnel. Refer to the trailer's technical manual on your water trailer for maintenance instructions.

- Before filling at water distribution points:

STEP 1: Check interior for gross contamination.

STEP 2: Check hose used to fill trailer. Water point fill hose should not come in contact with the ground. If the hose is lying on the ground, wash the end before use.

STEP 3: After filling, check manhole cover and drain plug to ensure that they are secure.

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CAUTION

Personnel detailed to fill water trailers must be directed to fill the trailers only at approved water points.

COLLAPSIBLE FABRIC DRUMS/PILLOWS/ONION TANKS:

STEP 1: Interior: Check for dirt and other contamination; check for holes.

STEP 2: Fill holes: Check to ensure that fill holes are clean and covers are in place.

STEP 3: Exterior: Check to ensure the exterior is free of oils and other contaminants that may seep into the bag and contaminate the water.

LYSTER BAGS:

STEP 1: Interior: Check for dirt and other contamination; check for holes.

STEP 2: Cover: Check to make sure it fits. Check for holes.

STEP 3: Spigots: Make sure spigots are clean and in place.

STEP 4: Location: Elevate Lyster bags sufficiently to prevent contamination of spigots by wildlife. Always clean the Lyster bag prior to its first use and periodically thereafter with potable water.

WATER CANS: Check interior for contamination; if can has a fuel odor, such as gasoline, do not use it for drinking water.

TASK 6: Check Unit Water Supply For Chlorine Residual.

EQUIPMENT NEEDED:

- Chlorination Test Strips (NSN 6630-01-012-4093)
- Field Manual (NSN 7530-00-286-6211)
- Writing material (NSN 7520-01-058-9978)

Check the chlorine residual when—

- Filling unit containers at water distribution points.
- Water containers arrive in unit area.
- Directed by command medical authority.
- Treating a raw water supply.

STEPS OF PERFORMANCE:

STEP 1: Determine the desired chlorine residual in milligrams per liter (mg/L).

- At the point of consumption, water obtained from an approved water distribution point should have at least a trace of chlorine residual.

- When the unit must obtain water from a raw water supply, or from another source such as a stream or pond, the finished product should have a 5-mg/L chlorine residual after 30 minutes. Under certain conditions, the local medical authority may direct a higher residual.

STEP 2: Flush the spigots of the water container being checked and fill the color comparator tube to a point just below the top of the tube.

STEP 3: Place one chlorine test tablet in the comparator and allow it to dissolve.

STEP 4: Hold the color comparator at eye level and toward a good light source.

STEP 5: Compare the color of the water with the color disc on the opposite side of the color comparator.

- The water is safe to use if the color of the water is the same shade or darker than the required color for the chlorine residual.
- The water must be chlorinated if the color is lighter than the required residual.

TASK 7: Chlorinate Water Supplies.

EQUIPMENT NEEDED:

- Field chlorination kit (NSN 6850-00-270-6225 or NSN 6850-01-374-9921).
- 6-ounce jar of calcium hypochlorite (HTH) (NSN 6810-00-255-0471)
- (70 percent chlorine)/a container of 5- to 6-percent household bleach.

CHLORINATE THE WATER WHEN–

- The water supply has no chlorine residual.
- The chlorine residual is below required level.
- A raw (untreated) or unapproved water supply must be used.

STEPS OF PERFORMANCE:

STEP 1: Before adding chlorine, check the chlorine residual following the procedures in Task 6.

STEP 2: If the chlorine residual is less than the desired level, add enough chlorine to raise the residual to the required level. Use Table A-1 to determine the amount to add to untreated water. If 10mg/L chlorine residual is required, double these amounts. To increase the residual in treated water, smaller quantities of chlorine will be needed.

STEP 3: Wait 10 minutes, and then check the chlorine residual.

STEP 4: If the residual is less than 5 mg/L, repeat steps 2 and 3 using a smaller amount of chlorine.

STEP 5: If the residual is at least 5 mg/L, wait an additional 20 minutes before drinking.

Table A-1. Amounts of HTH and Bleach Equivalent to a 5 mg/L Dose in Various Volumes of Water Volume.*

VOLUME	MRE AMPULES	HTH		5% BLEACH	
		MESSKIT SPOON	MRE SPOON	MESSKIT SPOON	SPOON
5 GAL	0.5			0.5	
10 GAL	1.0			1.0	
20 GAL	1.0			2.0	
32 GAL	2.0			2.0	1.0
36 GAL	2.0	0.5		3.0	1.0
50 GAL	3.0	0.5		3.0	1.0
55 GAL	3.0	0.5		4.0	1.0
100 GAL	6.0	1.0		7.0	2.0
150 GAL	8.0	1.0		10.0	3.0
160 GAL	9.0	1.0		11.0	3.0
250 GAL	14.0	2.0	0.5	17.0	5.0
400 GAL	22.0	3.0	1.0	26.0	7.0
500 GAL	27.0	3.0	1.0	33.0	9.0
1000 GAL	54.0	7.0	2.0	66.0	18.0
3000 GAL	162.0	20.0	6.0	196.0	54.0
5000 GAL	270.0	33.0	10.0	327.0	90.0

*THE QUANTITIES DEPICTED IN THIS TABLE ARE GENERAL GUIDELINES, ACTUAL AMOUNTS MAY VARY BASED ON WATER QUALITY.

TASK 8: Set Up, Construct, And Maintain Field Waste Disposal Devices.

EQUIPMENT NEEDED:

- Collect material for type of improvised facilities to be constructed, if required.
- Establish a detail to set up or construct the devices.

DISPOSAL METHODS THAT MAY BE USED IN THE FIELD:

A-1. Local, state, and federal regulations prohibit the burning or burial of waste in CONUS. Host-nation regulations or laws may also prohibit burning or burial of waste. The garbage, rubbish, and other such material may have to be transported to a waste disposal facility within the CONUS where chemical toilets are the required for human waste disposal devices for use during field exercises. Improvised devices may be used under emergency conditions and contingency operations when large numbers of troops are deployed; in those instances the burnout latrine is the preferred method for improvised devices.

A-2. This section presents those PMM for liquid and solid waste disposal that can be improvised by troops engaged in warfare, peacekeeping operations, disaster relief operations, or other situations in which normal public utilities are not available.

- Effective improvisation of field apparatus is vital to the prevention of illnesses during any military operation. The efficiency with which such measures are applied is the foundation of military preventive medicine, and is the responsibility not only of the force commander but also of all personnel serving under him/he.
- Field sanitary apparatus must be of simple design, and easily built from materials that are

1 readily available. It is an error to predicate a method upon the salvage of a particular
2 supply item furnishing material. At one stage of the Second World War, field sanitation
3 almost broke down when jerricans were substituted for a light tin petrol container which
4 had been a non-returnable item and which had, as a result, been a valuable source of
5 material for many sanitary procedures.
6

7 A-3. The methods and illustrations presented in this Appendix must be regarded as basic
8 ideas, which from the practical standpoint in the field can be subject to modification and
9 improvement. For example, in the Second World War, it was speedily realized that ration
10 boxes could be salvaged for the building of latrine seats and that empty oil drums have
11 versatility as a source of material for incinerators, stoves, hot water tanks, and latrines.
12

13 A-4. The effective disposal of human feces and urine is of the utmost importance in the
14 prevention of diarrhea diseases and the control of arthropod vectors.
15

- 16 • The following point should be considered for all latrines and urinals.
- 17 • The latrine or urinal site should be chosen at least 100 meters downwind from food service
18 areas of the camp and at least 30 meters from water supplies to prevent contamination of
19 food and water supplies. They should be placed at least 30 meters from an inhabited area
20 (such as troop billets) but within a reasonable distance to ensure easy access from the
21 living/dining areas to encourage the use of the latrines and urinals.
- 22 • Flies live and feed on excreta, then become attracted to food and so spread
23 disease. Therefore, flies must be prevented from gaining access to the waste. Appropriate use
24 of and application of pesticides can be found in AFPMB TM 24.
- 25 • Where the ground is so hard that it precludes digging or where the water
26 table is so high trenches rapidly fill with water, excavation type latrines and urinals may not
27 be suitable. Therefore, examine and consider the nature of the soil when choosing the
28 appropriate latrine and urinals for the site.
29

30 A-5. No matter what type of latrine or urinal is employed, hand-washing
31 stations/devices must be installed and hand washing enforced. The device must be
32 kept filled with clean water, provided with soap, and easy to operate. Hand-
33 washing greatly reduces the spread of disease.
34

35 A-6. Latrines and urinals must be cleaned daily and provided with toilet
36 paper. Toilet paper and waterproof containers to hold it are essential. If the
37 latrine does not have a roof, ensure that the toilet paper holder is waterproof.
38

39 A-7. (Refer to Figure A-1). For privacy, some form of screen such as brushwood or
40 sacking should surround all forms and types of field latrines, urinals, and shower
41 facilities illustrated in this manual. The latrine screen, shown in figure A-1, can be
42 used for such a purpose for all single and multiple user latrines, urinals, and shower
43 facilities. The screen latrine is a CTA item (NSN 8340-01-027-2170) and can be
44 purchased by the unit.
45

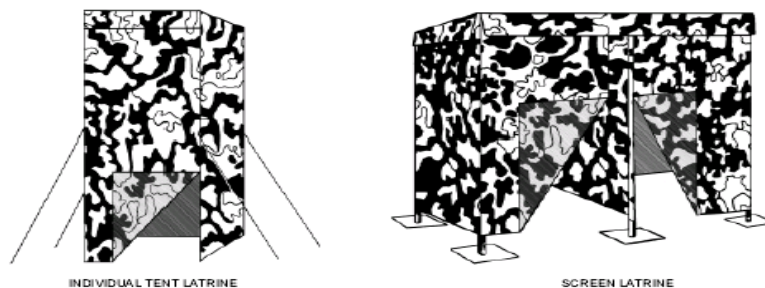


Figure A-1. Example Of Latrine Screens

A-8. The number of latrines provided should be sufficient to serve at least 4 percent of the males and 6 percent of the females at one time. Urinals should be provided for at least 2 percent of the male population, in addition to the latrines, to prevent soiling of the toilet seats.

- It is estimated that, as an average, the individual man produces 200 grams (0.4 pounds) of feces, roughly one-seventh the food eaten, and 1.5 liters (0.4 gallons) of urine per day. This amount is conditioned by the nature and type of food intake, degree of activity, climate, and other factors and would average 160 kilograms (353 pounds) of feces and 1200 liters (317 gallons) of urine per battalion per day (approximately 800 soldiers).

A-9. The wars of the twentieth century have resulted in a wide variety of latrines and urinals being devised for field use. All of these devices fall into one of three categories: excavated latrines, receptacle latrines, and urinals. The disposal methods for human wastes will vary with the tactical situation, materials available, and the soil conditions.

A-10. In excavated latrines, the user defecates directly into a pit, and the deposit can be immediately covered with earth. They include:

- Cat-Hole Latrine
- Shallow Trench Latrine
- Deep Trench Latrine
- Bored-Hole Latrine
- Mound Latrine

A-11. With receptacle or pail latrines, much handling of the containers, with consequent risk of infection, is involved. Except in special circumstances, receptacle latrines should not be used. Types of receptacle latrines include:

- Pail Latrine
- Burnout Latrine
- Portable Chemical Latrine

A-12. Urinals may be built as an annex to a latrine or separately, the latter being preferable. Here again, disposal should be directly into properly prepared ground. Types of urinals include:

- Urine Soakage Pit
- Trough Urinal

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- Oil Urinal
- Shallow Trench Urinal

A-13. Excavated latrines include the cat-hole latrine, trench latrines (shallow and deep), the bored-hole latrine, and the mound latrine. In each of these types, excreta are disposed of without the necessity to further handle or remove receptacles. The pertinent details of each type will be separately discussed in succeeding paragraphs.

- *Cat-Hole Latrine.* (Figure A-2). This latrine is a hole between 150–300 mm (0.5–1 ft) deep that is covered after use. This type of latrine is good for units “on the march” or that are rapidly moving. The individual uses his entrenching tool for digging the “cat-hole” latrine.

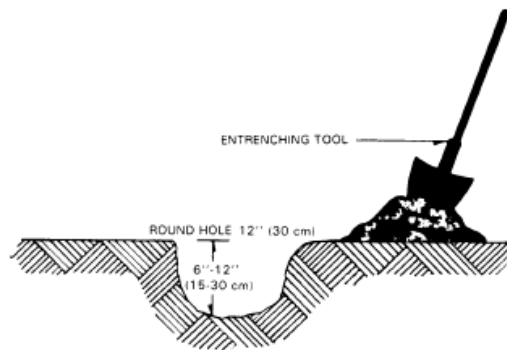


Figure A-2. Example Of Cat-Hole Latrine

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- *Shallow Trench Latrine.* (Figure A-3). This type of latrine is used for short halts and in bivouacs, if occupancy is for less than three days. The trench is dug 1.2 meters (4 ft) in length, 300 mm (1 ft) in width, and 750 mm (2.5 ft) in depth, and will accommodate two men at one time. The trenches should be spaced in rows, at least 600 mm (2 ft) apart, allowing five trenches for the first 100 men and three for every additional 100 men or less. The floor of the trench should be more than 900 mm (3 ft) above the ground water table. The removed earth is placed at the end of each trench together with a shovel or a scoop made from cans or wood. Users cover their excreta with 25-27 mm (1-3 inches) of earth immediately, to keep the latrine sanitary. The user should squat astride the trench; boards or rocks may be placed along side of the trench to provide better footing. The sides of latrine pits will need revetments to prevent collapse. Trenches should be covered with earth and sprayed with insecticide when the contents reach 300 mm (1 ft) from the top. The remaining earth is then filled in and packed down and the site marked with a contaminated site sign (Figure A-4).

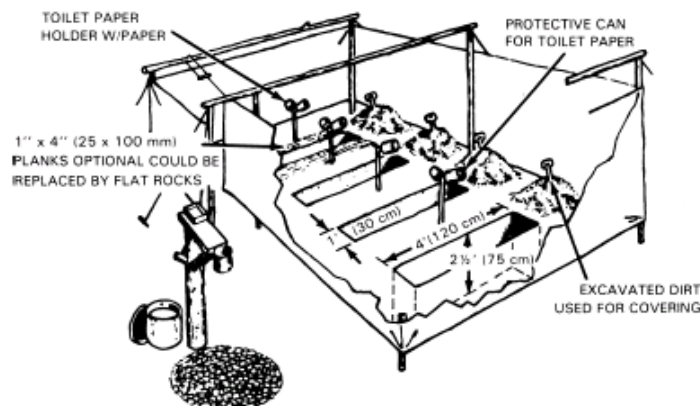


Figure A-3. Example Of A Shallow Trench Latrine (Shown With Hand Washing Device)

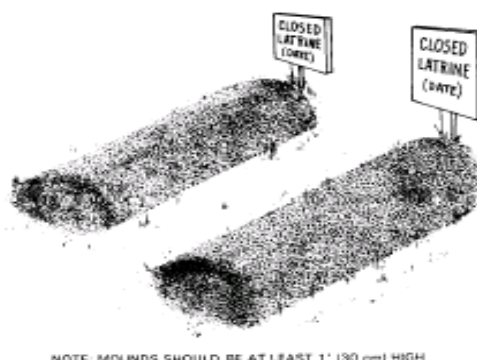


Figure A-4. Example Of Closed And Marked Latrine Site

- Deep Trench Latrine.* (Figure A-5). This type of latrine is a most satisfactory substitute for a water carried system in field locations where occupancy is likely to be prolonged. The deep trench latrine consists of a pit approximately 1.8 meters (6 ft) in depth, 600 meters (2 ft) wide, and approximately 2.4 meters (8 ft) in length, surmounted by an enclosed, tight lumber or heavy plywood seat, which should not exceed 400 mm (16 inches) in height, the base of which is banked with packed earth. The sides of latrine pits will need revetments to prevent collapse. This type of latrine will seat four or five persons. Under the front of each seat opening a metal shield is placed, to deflect urine to the center of the pit bottom. The seat openings must be provided with hinged self-closing lids so that the entire seat structure is fly-proof. The latrine should be surrounded by a screen or provided with a weatherproof superstructure, preferably the latter. Floors should be kept dry by the provision of duckboards, and by a shallow perimeter trench to divert surface water. Install a vent stack in the more permanent latrines to release moisture-laden gases of decomposition. This will prevent condensation from forming on the inside of the self-closing lids. The outside opening of the vent stack must be screened, in

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order to prevent arthropod vectors from gaining access.

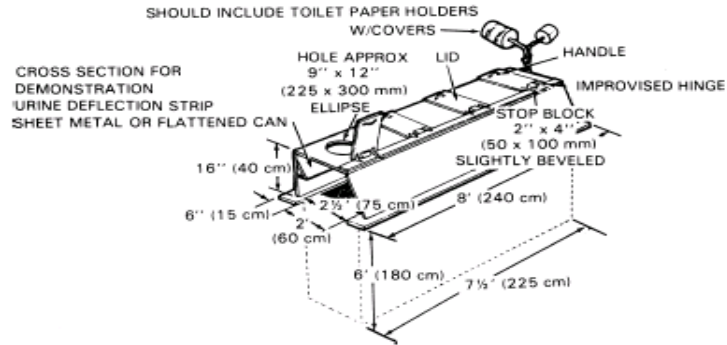


Figure A-5. Example Of Deep Trench Latrine

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- *Bored-Hole Latrine.* (Figure A-6). A bored-hole latrine is a vertical boring in the soil, approximately 450 mm (18 inches) in diameter, made with a soil auger, and from 4.6 meters to 6.0 meters (15 ft to 20 ft) in depth. A collar and a fly proof seat superstructure, or a pedestal type seat can be improvised from a length of sewer pipe or a metal drum of suitable diameter. Seats of either type must be carefully centered and tightly fixed in position to prevent fouling. Bored-hole latrines should be placed 1800 mm (6 ft) apart, surrounded by surface drains. Screening or shelter superstructure should be provided. With this type of latrine, special care must be exercised to locate the borings so that water wells do not become polluted. When properly sited, the bored-hole latrine is suitable for long-term use. Care must always be taken to ensure that the boring does not deviate from the vertical.

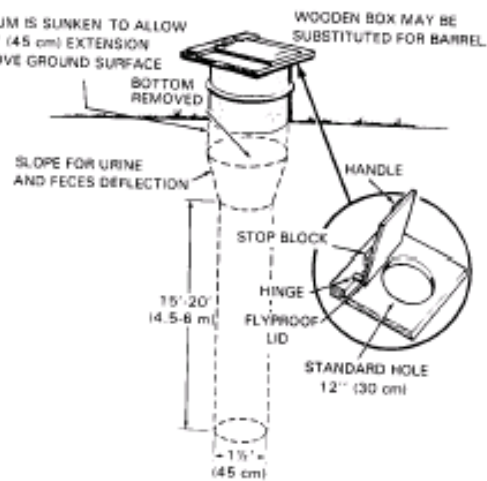


Figure A-6. Example Of Bored-Hole Latrine

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- *Mound Latrine.* (Figure A-7). This type of latrine when a high ground water table or rock formation near the ground surface prevents digging a

1 deep pit. A dirt mound makes it possible to build a deep pit latrine and still
 2 not have the pit extend into the water or the rock. A mound of earth having
 3 a top at least 1.8 m (6 ft) wide and 2.4 m (8 ft) long should be constructed so
 4 that an improvised 4-seat latrine box may be placed on its top. The mound
 5 should be high enough to meet the pit's requirement for depth, allowing 300
 6 mm (1 ft) from the base of the pit to the water or rock level. Before the
 7 mound is built, the surface of the ground where it is to be built should be
 8 broken up to aid in seepage of liquids from the pit. The mound is then build
 9 in 300 mm (1 ft) layers and the soil compacted. When the desired height
 10 has been reached, the pit is dug into the mound. It may be necessary to
 11 brace the walls with wood, sandbags, or other suitable material to prevent
 12 cave-ins. The mound latrine must be fly-proofed and closed in the same
 13 manner as the deep trench latrine.

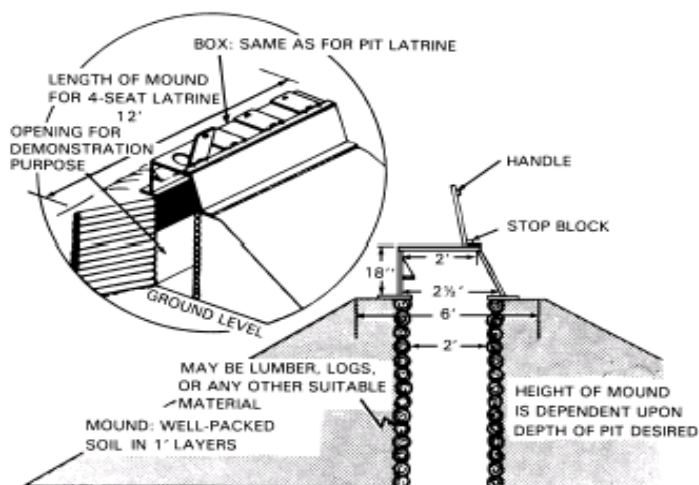


Figure A-7. Example Of A Mound Latrine

- *Receptacle Latrines.* Receptacle latrines include pails (“honey buckets”) or bags, burnout latrines, and portable chemical toilets, all of which have their merits and demerits. The use of any type of receptacle system must be governed by circumstances, and the availability of facilities to render it hygienically acceptable.
- *Pail Latrine.* (Figure A-8 and A-9). A pail latrine may be built when condition (populated areas, rocky soil) are such that a trench latrine cannot be used. A standard type latrine box may be converted for use as a pail latrine by placing hinged doors on the rear of the box, adding a floor, and placing a pail under each seat. The seats and rear doors should be self-closing and the entire box made fly proof. The floor of the box should be made of an impervious material (concrete, if possible) and should slope enough toward the rear to facilitate rapid drainage of washing water. Pails should be cleaned at least once daily, more often if necessary. The contents may be buried, burned, or disposed by other sanitary methods. When pails are replaced after having been cleaned, they should contain 25 mm (1 inch) of disinfectant. Heavy plastic bags may be used in the pails for ease of disposal.

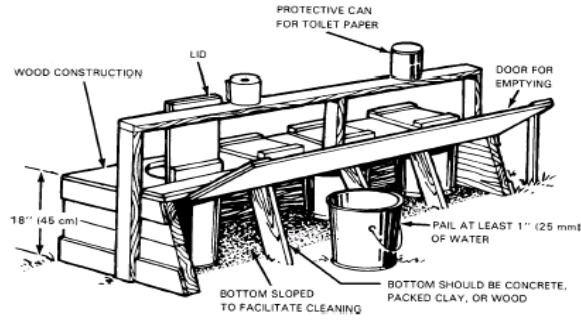


Figure A-8. Example Of Pail Latrine-1

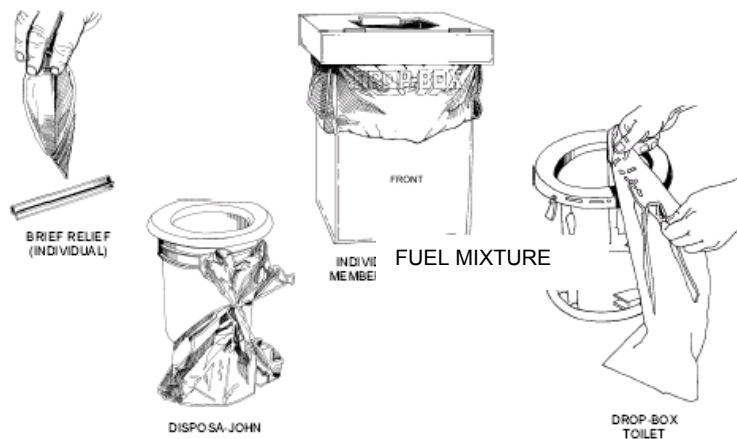


Figure A-9. Example Of Pail Latrine-2

- *Burnout Latrine.* (Figure A-10). This latrine may also be used where the deep pit latrine is undesirable because of soil conditions (hard, frozen, rocky or a high ground water table) prevent digging a deep pit. The burnout latrine is made by cutting a 55-gallon drum in half. Weld handles to the tops of the barrel halves for removing from them from the latrines. The open end of the drum is then fitted with a fly proof seat with a self-closing lid.

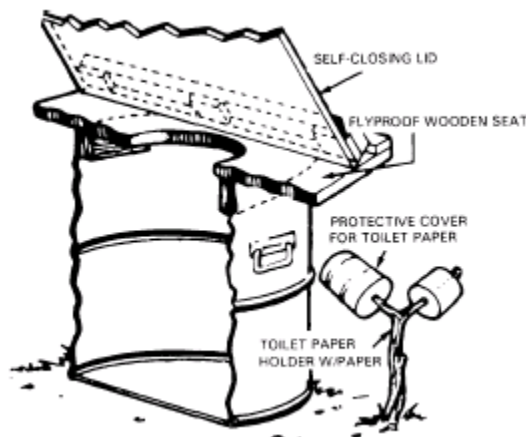


Figure A-10. An Example Of A Burnout Latrine

A-14. For the burnout latrines with "honey buckets" or barrels, extreme caution must be used in burning their contents.

CAUTION

Follow burning instructions very carefully. Do not stand near the pail or barrel openings when igniting the contents of the pail or barrel. Make sure that the fuel mixtures completely and covers the material in the pail or barrel before igniting the contents.

A-15. All barrels must be "primed" with 3 inches of a fuel mixture consisting of one part regular gasoline, also called, "mogas" and four parts diesel fuel prior to placing the containers into service. This allows the fecal matter to become oil soaked enhancing complete thermal destruction of fecal matter during the daily (or more often, if needed) burn out process. The oil also serves as an insect repellent and obnoxious odor deterrent.

CAUTION!!

Ensure that "NO SMOKING" signage is conspicuously posted inside and outside of the structure.

A-16. When a barrel is 1/2 to 2/3 full of fecal material, it must be removed from the seat structure and burned out. Ensure that each container is moved far enough away from the latrine structure as to not catch the structure on fire and as far away as 100 yards and down wind from human residences.

1 A-17. Encourage personnel to use urine soakage pits or other methods of
2 urine disposal instead of burn barrel latrines since additional fuel will be
3 required to promote complete burning. Burning fecal mater only, should take
4 only twenty minutes to burn down to ash. Urine mixed with the fecal mater
5 could take up to two hours to burn down to ash.

6 A-18. Once the containers are removed from the seat structure and moved
7 away from the structure pour enough of the fuel mixture to cover the contents
8 in the containers. ("Mogas" will not be readily available on the battlefield,
9 PVNTMED detachments and the FLD SAM TM will have to plan for its use
10 and order it for this purpose ahead of time.) If it is not available, then use
11 only JP-8 (It will be harder to get ignited.)

12 A-19. Wrap a strip of old scrap of cloth (old none useable BDU or Cammie
13 uniforms torn in to rag strips) around one end of the four foot long stirring
14 stick (mop or broom handle). Secure to one end of the stirring stick. Use the
15 wrapped end of the stick to mix the contents in the burn out containers.

16 A-20. When the contents of the container are thoroughly mixed, remove the
17 wrapped end of the stick from the container and move away from the
18 containers to be burned and have an assistant light the wrapped end with a
19 lighter or match.

20 A-21. Stand at least four feet away from the container, and carefully place
21 the lit rag-end of the stick up to the lip of the container. The fumes from the
22 fuel mixture from the container will ignite first causing a flash-bang effect as
23 the rest of the fuel ignites in the container.

24
25 **WARNING**

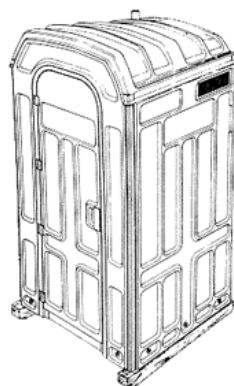
26 **This procedure is extremely dangerous and must be**
27 **conducted with extreme care. The service member**
28 **that ignites the containers must stand well back**
29 **from the edge of the container when igniting the**
30 **contents in the containers. Using the four-foot long**
31 **stick with a rag or cloth rapped tightly around one**
32 **end of the end of the stick is the safest method to**
33 **start the fuels and fecal matter on fire.**

34 A-22. When preparing to begin the burnout operation, have an assistant
35 ignite the stirring stick's rapped end of the stirring stick. Sticks or poles that
36 are to be used must be at least four feet in length. Sticks or poles less than
37 four feet in length must be replaced.

- 38 • Standing at least four feet away from the container, ignite the rapped end of
39 the stirring stick while holding it well away from the containers to be burned.
- 40 • Burning must be continued until the contents of the barrels are reduced to a
41 fine gray ash, which may take more than one attempt. Once the containers
contents are completely burned to a fine ash, let the containers cool before
Bury the contents well away from human domains and to a depth of 12

1 inches. removing the ash. Do not scatter the ashes from the containers over
2 ground or water surfaces; always bury them.

3
4 *Portable Chemical Latrine.* (Figures A-11). This type of latrine can be
5 suitable when troops are required to camp in urban areas or when other
6 methods of human waste disposal are not practical. In such cases, the
7 provision of chemical toilets may obviate the necessity of damaging public
8 parks or other areas in ways objectionable to local officials. Daily sanitary
9 maintenance is required. Proper disposal of human wastes removed from the
10 chemical toilet is the responsibility of the operating unit. The use of chemical
11 toilets requires planning, maintenance, and logistical support for the cleaning
12 and disposal of waste.
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Figure A-11. An Example Of A Portable Chemical Latrine

- *Urinals.* There is a misconception that urine presents little hazard in the transmission of disease. Urine, for example, may contain typhoid bacilli or the virus of mumps and other pathogens when excreted by an infected person. In addition, failure to provide urinals quickly results in a fouled camp. Urinals should be located close to latrines. If the units are spread out, it will increase sanitation levels to place urinals in sub-unit areas in addition to near the latrines. As with latrines, receptacles may be used and have the same disadvantages. Urine buckets should never be used where other measures are feasible. Four types of field urinals have been proven consistently satisfactory.
- *Urine Soakage Pit.* (Figure A-12). This is the best device for the disposal of urine in the field. This urinal is built by first preparing the soakage pit, as shown in the figure, 1200 mm (4 ft) in length by 1200 mm (4 ft) in width by 1200 mm (4 ft) in depth. It is then filled with rocks, flattened cans, broken bottles, or other coarse material. Four to six conical metal funnels are built into the pit and provided with strainers or screen wire to keep flies out. It may be assumed that one set of funnels will be required for 100 men. The pipes should be at least 25 mm (1 inch) in diameter and extend at least 200 mm (8 inches) below the surface of the pit. The mouths of the funnels should be at an average height of 750 mm (2.5 ft) from the ground. The urinal should be mopped down daily with a medically approved disinfectant.

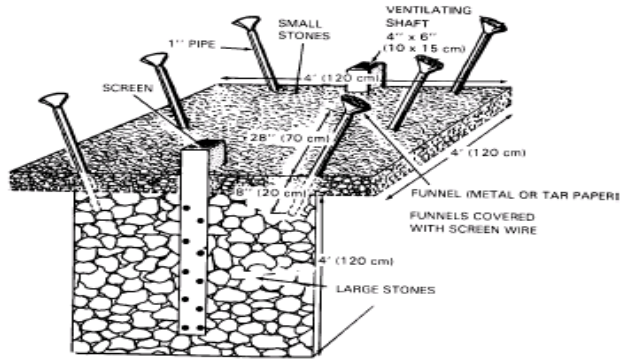


Figure A-12. An Example Of A Urine Soakage Pit

- *Trough Urinal.* (Figure A-13). This urinal is made from a sheet of corrugated iron, or plain galvanized sheeting, in the form of a trough with a high back, raised to a height of about 750 mm (2.5 ft) on supports, and sloping to a drainpipe with leads into a soakage pit. The ends of the trough are closed, and a wire screen is placed over the outlet. It may be assumed that 2400 mm (8 ft) of trough will be required for 100 men. The urinal should be mopped down daily with a medically approved disinfectant.

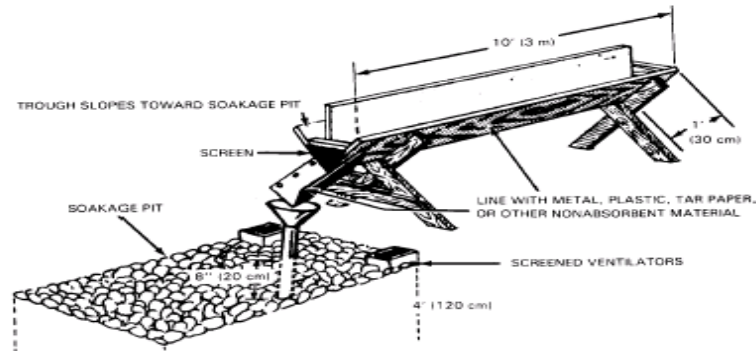


Figure A-13. An Example Of A Trough Urinal

- *Oil Urinal.* (Figures A-14 and A-15). These urinals consist of either a large or small drum positioned at a soakage pit. Because urine has a higher specific gravity than oil, it immediately disappears on striking the oil and flows directly to the bottom of the drum. When additional urine is added, the urine overflows through the notch in the pipe and down through the 38 mm (1.5 inch) pipe into the soakage pit. A small amount of waste oil is poured onto the surface of the water to provide an odor free urinal. To begin operation of the oil urinal, place the completed device in position in the pit. Pack dirt around the drum to ground level. Pour at least 300 mm (1 ft) of water into the drum. Then add waste oil, approximately 121 liters (32 gallons), until it reaches the top of the 75 mm (3 inch) pipe cap. Oil urinals are low maintenance devices; only routine maintenance is required to periodically remove debris from the screen to prevent clogging. One oil urinal may accommodate 4 men at one time.

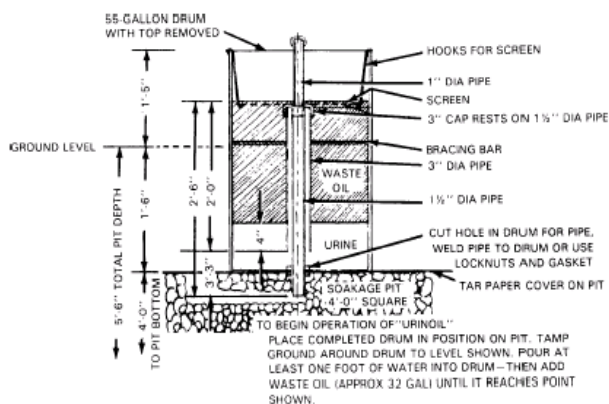


Figure A-14. An Example Of An Oil Urinal-1

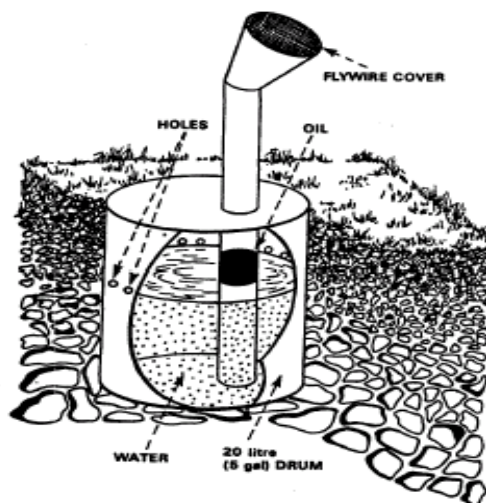


Figure A-15. An Example Of An Oil Urinal-2

• *Shallow Trench Urinal.* A shallow trench urinal will provide a satisfactory urinal for short halts or in short bivouacs (less than one week). Shallow trench urinals are prepared in the same manner as shallow trench latrines but are 600 mm (2 ft) in width. The bottom of the trench is then covered with a layer of stones or the earth thoroughly loosened. This type of urinal must be filled in when no longer required. It may be assumed that 2700 mm (9 ft) length of shallow trench will be required for 100 men.

• *Materials-Sources.* In the field, much of the material required to construct latrines and urinals can be salvaged from damaged buildings, or by cannibalizing non-essential structures. Hinges can be improvised from scrap leather, automobile tires, or any tough webbing fabric. Waste oil can be used in the construction of the oil urinals. Urine deflector shields can be improvised from any light sheet metal, such as cans. Metal cans could be used to store soap for hand-washing stations or as waterproof covers for toilet paper.

• *Fly Control.* Particular care must be exercised to exclude and control flies. It

1 must be remembered that, despite all precautions, fly maggots may hatch out
2 in a trench latrine and larvae will seek the surface through the soil. Pesticide
3 sprays used correctly can be an effective measure for fly control. Approved
4 residual pesticides should be applied after a survey of the latrine pit has
5 identified fly breeding. Do not spray latrine pits daily since flies can develop
6 resistance to pesticides that are used routinely.
7

8 • *Maintenance.*

- 9 ▪ Latrines should be cleaned daily to maintain sanitary conditions and to
10 control potential insect breeding.
- 11 ▪ Disinfectants must not be used in trench latrines. Such chemicals interfere
12 with the natural process of digestion and liquefaction of the contents.
13 Latrine seats do require regular scrubbing with soap and water;
14 disinfectants should be applied to the seats only as medically directed.
- 15 ▪ Latrines used during the winter months should be wind proofed. Heated
16 latrines have been used, but with varying degrees of satisfaction since any
17 form of electric, solid fuel, or oil heat, requires careful installation and
18 involves additional layout and technical guidance.
- 19 ▪ A light cover of earth, approximately 25-75 mm (1-3 inches) should be
20 applied to trench latrine contents daily. If water has seeped into the
21 trench, additional earth will be necessary to cover the waste and control
22 odors.
- 23 ▪ In winter, the fecal mass in trench latrines fills more rapidly than in
24 summer. For this reason, additional pits should be available.
- 25 ▪ At any season, when the contents reach to within 600 mm (2 ft) of the
26 trench top, the trench should be filled in, after being sprayed with an
27 approved insecticide. Then the earth cover is tightly packed to the top of
28 the trench, and the site clearly marked with a contaminated site sign.
- 29 ▪ All excavated latrines and urinals must be so located that they do not
30 pollute a source or potential source of water supply. As a general rule, the
31 bottom of any latrine trench or soakage pit should be at least 900 mm to
32 1200 mm (3 ft to 4 ft) above the ground water table, and 30m to 45m
33 downgrade from any well, spring, or other surface water source. Under no
34 circumstances, should any sanitary appliance be drained into a dry well.
- 35 ▪ Hand-washing facilities should be located between or adjacent to all
36 latrines and urinals. Potable water, soakage pits, soap, paper towels, and
37 trash receptacles should be provided for each hand-washing station and
38 maintained daily.

39 • *Miscellaneous.*

- 40 ▪ Toilet paper, in a waterproof container, must be provided.
41 In standing camps, latrines must be clearly marked as such, direction
42 signs provided if necessary, and lighted at night, if the tactical situation
43 permits.
- 44 ▪ Floors of latrine structures must be kept dry, duckboards and perimeter
45 drainage must be provided.
- 46 ▪ If latrines are roofed, the roof must be sloped and the edge extended to
47 sufficiently clear the earth banking to prevent washouts and consequent
48 loss of fly proofing in wet weather.
- 49 ▪ *Closure.* When a latrine has been filled to within 300 mm (1 ft) of the
50 surface, or when it is to be abandoned, it must be closed. The contents of
51 the pit, the sidewalls, and the ground surface (to a distance of 600 mm (2
52 ft) from the sidewalls) should be sprayed with an approved insecticide.

1 The pit is then filled to ground level with successive, 75 mm (3 inch) layers of
2 earth. Each layer is packed down and its surface is sprayed with insecticide
3 before the next layer is added. Then, the latrine pit is mounded over with at
4 least 300 mm (1 ft) of compacted earth. The purpose of this method of closing
5 is to prevent emergence of flies that may hatch in the closed latrine.

6 ▪ *Marking.* Closed latrines and urinals should be marked with a
7 contaminated site sign (Figure A-4 indicating “CLOSED LATRINE” or
8 “CLOSED SOAKAGE PIT.”)
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SECTION II – DISPOSAL OF SOLID REFUSE

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13 A-23. In the field, solid refuse generated by troops requiring sanitary disposal
14 falls into two categories. These are the food wastes and the relatively dry
15 materials such as cartons, paper, plastics, cans, and other containers. Food
16 wastes attract insects, especially flies and rats. The dry wastes attract insects
17 and will furnish harborages and breeding sites for these pests. Consequently,
18 the destruction or other disposal of all refuse is important in the control of
19 communicable disease. Disposal by fixed facility incineration or sanitary
20 landfill is appropriate in static situations, but in the field, many of the
21 disposal appliances used must be improvised. Military sanitarians have long
22 preferred incineration as the disposal method of choice because this measure
23 ensures complete destruction of objectionable material. The mixing of the dry
24 combustible refuse with the food wastes facilitates burning in an incinerator.
25 Burial can be used in those situations where incineration is not feasible.
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27 A-24. Whatever method is used will depend upon medical advice and the
28 combat/tactical situation, but it must be speedy, and it must be thorough. The
29 increased mobility of modern warfare has not decreased the importance of
30 sanitary refuse disposal to the health and comfort of troops, for contaminated
31 areas favor disease.
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33 A-25. Hazardous waste includes waste that is ignitable, corrosive, reactive, or
34 toxic. Examples include, but are not limited to petroleum, oils, and lubricants
35 (POL), batteries, and solvents typically associated with military operations.
36

37 A-26. Hazardous waste typically requires special segregation, handling,
38 transportation, disposal, and documentation or treatment to render it non-
39 hazardous. Disposal methods for this type of waste must comply with host
40 nation, nation-specific, or operation-specific established standards.
41

42 A-27. Engineer and preventive medicine support elements should be
43 contacted to advise on required disposal procedures.
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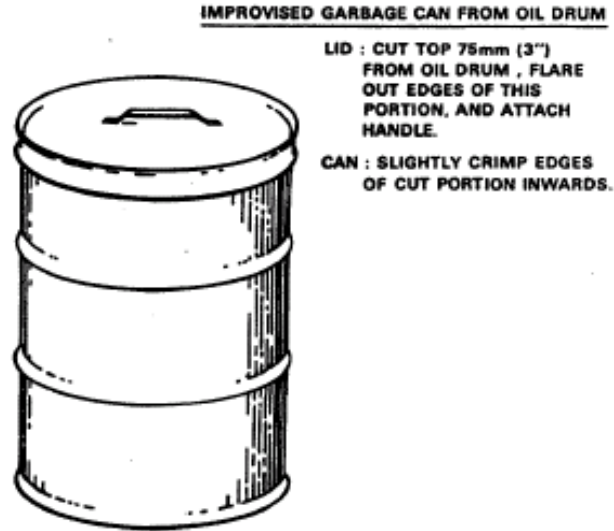
45 A-28. Disposal methods for this type of waste must comply with national,
46 host nation (HN), or operation-specific established standards. Engineer and
47 preventive medicine support elements should be contacted to advise on
48 required disposal procedures.
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- 50 • (Figure A-16.) Containers for refuse are essential, however small the force.
51 The containers should be of two types, one devoted to cookhouse use for food

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wastes, the other as a receptacle for dry refuse. Either or both can be improvised from oil drums or other similar material. Containers for food waste must be covered in all climates. The conversion of oil drums into a refuse can is illustrated in Figure A-16.

- Where a metal container has an open end, an efficient cover can be made from wood, metal or a square of sacking, or other tough fabric, and weighted at the corners. All containers should be emptied frequently; emptying containers daily is recommended. Empty sacks and plastic bags may be used to collect solid wastes, but must be supported in an upright position by stakes.



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Figure A-16. Example Of Improved Refuse Can

A-29. As a general rule, garbage pits and trenches should be located at least 30 meters down-wind from the camp and food service areas. The two methods described below are suitable for short and long stays. However, if the quantities of solid waste generated by the units in an area make on-site burial impractical, arrangements should be made for the collection and removal to an approved disposal site, e.g. sanitary land fill or incineration site.

- (Figure A-17). On the march, in bivouac, or in camps of less than 1-week duration, garbage and rubbish may be buried in pits. For this purpose, a pit 1200 mm (4 ft) in length by 1200 mm (4 ft) in width by 1200 mm (4 ft) in depth is suitable for one day for 100 men.
- Care should be taken to flatten cans and break down boxes before they are added to the rubbish. Fill to 300 mm (1 ft) from the top and add 900 mm (3 ft) of packed earth cover.

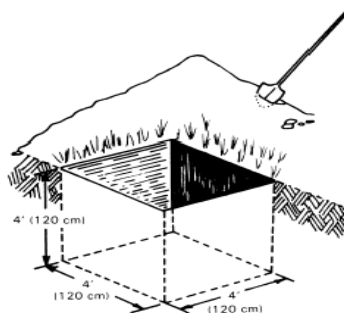


Figure A-17. Example of a Garbage Pit

A-30. The continuous trench is more adaptable to stays of two days or more. The trench is first dug about 600 mm (2 ft) wide, 900 mm to 1200 mm (3 ft to 4 ft) deep, and long enough to accommodate the garbage for the first day. As in the pit method, the trench is filled to not more than 300 mm (1 ft) from the top. The trench is extended as required, and the excavated soil is used to cover and mound the garbage already deposited. This procedure is repeated daily or as often as garbage is dumped. A 900 mm (3 ft) cover of compacted earth will be used to cover the trench when closed. It is very efficient for disposing of garbage.

- Closed garbage pits and trenches should be marked with a contaminated site sign (like those in figure A-4 on page A-16) indicating “CLOSED GARBAGE PIT” or “CLOSED GARBAGE TRENCH”, rather than CLOSED LATRINE.
- The general rules for incinerators are:
 - Incinerators should not be used where a fire hazard exists, e.g. adjacent to POL, stored supplies of ammunition, or forested areas.
 - Incinerator wastes must be sorted to exclude explosive or highly flammable materials. Aerosol spray cans are never to be placed in an incinerator.
 - Unburned refuse must not be permitted to accumulate at an incineration site, unless in covered containers. Incinerators must be sited approximately 45 meters (50 yards) downwind of the camp, so that smoke, fumes, and fly ash do not pollute the area served. Where possible, incinerators should never be neglected as a potential source of heat for hot water supply. Although cold water is thought to be as efficient in cleaning as warm water, it is not readily acceptable (especially during cold weather). Therefore, any supplementary supply of warm water is in general support of the maintenance of health.

A-31. The following types of incinerators may be constructed for burning garbage and rubbish in the field.

- (Figure A-18). The barrel incinerators are easily made and will consume small amounts of garbage and combustible rubbish. A grate is made of scrap pipe inserted into the holes at the bottom of the barrel. An alternate method to create a grate is to leave the bottom in the barrel and punch holes in the bottom. The barrel may be supported on bricks or cans, filled with dirt, or it may be set on a trench to provide draft.

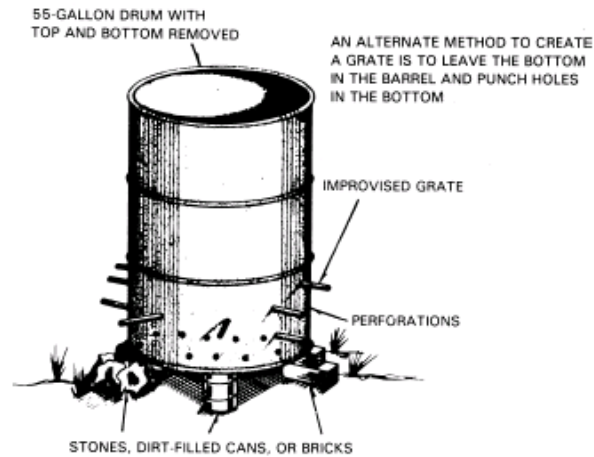


Figure A-18. Example Of A Barrel Incinerator

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A-32. (Figure A-19). The graduated feed incinerator is easy to construct, operate, and maintain. It is made of corrugated iron sheets and iron rods. The corrugated sheets are assembled to form a box approximately 1200 mm (4 ft) in length, 600 mm (2 ft) in width, and 1800 mm (6 ft) in height. The grate is made of iron bars and corrugated sheets perforated with holes to allow draft. Inside, three to four angled sheets of corrugated iron, supported by iron rods, are placed to allow the waste dumped into the top of the incinerator to burn and gradually fall down through the device. A trench can be dug along the bottom to collect ash and allow for draft. The incinerator should be supported in the same manner as the barrel incinerator.

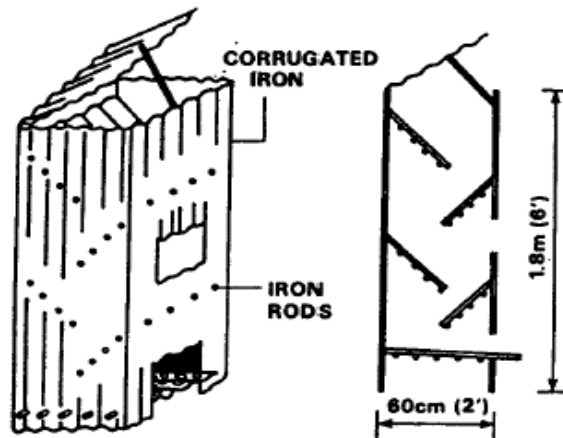
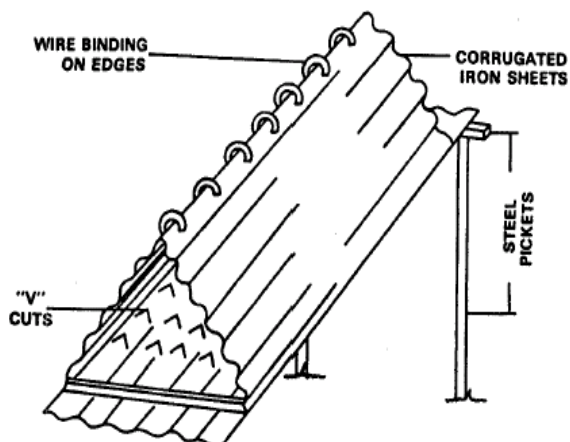


Figure A-19. An Example Of A Graduated Incinerator

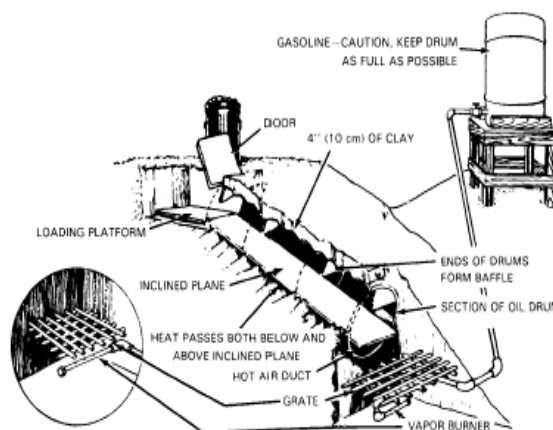
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- (Figures A-20 and A-21.) The inclined plane incinerator can be very useful in temporary camps. This device is particularly suitable for burning wet garbage and combustible rubbish. An auxiliary fire is required at the grate to obtain good combustion. A vapor burner is an excellent heating device and is constructed as shown in Figure A-21. The vapor-type burner uses petrol (gasoline). The operation of the vapor-type burner depends on the vaporization of the fuel by preheating

1 before burning. Burning the fuel, which escapes from the lower pipe of
 2 the burner, heats the fuels in the upper pipe, causing the fuel to
 3 vaporize. This vapor produces pressure in the lower pipe and forces the
 4 fuel out through small holes as a spray, thus producing an extremely
 5 hot fire. A properly operated burner will produce a blue flame. A yellow
 6 flame indicates incomplete burning and may be corrected by lowering
 7 the rate of flow in the line with the hand valve on the fuel container.



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10 Figure A-20. An Example Of An Inclined Plane Incinerator
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14 Figure A-21. Example Of An Inclined Plane Incinerator With Vapor Burner
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17 A-33. Field incinerators are readily built from almost any fire resistant
 18 material. An incinerator is not an efficient and sanitary waste disposal
 19 method unless it is built and operated so the refuse is completely burned.
 Several points on incinerator construction deserve comment:

- 20 • Any field incinerator should be located, where possible, on level dry
 21 ground and, if for semi-permanent use, on a concrete, brick or masonry
 22 platform. In any event, a shallow perimeter trench for drainage should
 23 surround the area.
- 24 • There must be sufficient air inlets to ensure adequate combustion, the
 25 outer opening being wider than the inner opening.
- 26 • Provision must be made for raking out ashes and cinders.

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- The incinerator must be built so that it can be loaded from the top (see Figures A-18, A-19, A-20, and A-21).
- Fire bars must not be fixed at the ends, to permit expansion from heat, otherwise the bars will buckle.
- Any closed incinerator should be provided with a chimney of suitable length to ensure adequate draught, and fitted with a damper and wire mesh spark arrester.
- Attempting to destroy excreta by incineration is not generally recommended.
- Ashes should be buried as for other rubbish and closed out as described in Figure A-21.

A-34. Prior to the disposal of dead animals, specific disposal guidance and procedures should be obtained from the medical services. The cadavers of small animals may be disposed by incineration or burial, but the destruction of large domestic animal cadavers by burning has not proven practical as a field sanitation measure. For these, burials using earth moving equipment is a more useful method. However, in the case of animals that have died from a communicable disease such as anthrax, incineration should be carried out to prevent subsequent soil or ground water contamination. The advice of medical personnel must be sought if it is suspected that animals have died from a communicable disease. Large quantities of fuel will be needed for this purpose and the operation must be supervised to ensure that it is thorough. Special attention must be given to the health protection of personnel in this circumstance. Where burial of animal cadavers is feasible, the pit bottom should be 900 mm to 1200 mm (3 ft to 4 ft) above the ground water table, and there should be a minimum of 900 mm (3 ft) of earth cover, packed down. The site should be marked with a contaminated site sign (Figures A-21) indicating the site as an “ANIMAL BURIAL SITE.”

A-35. Liquid wastes, which commonly need sanitary methods of disposal in the field, are those from cooking, laundry, and shower/bath facilities. These wastes are usually more concentrated because of the lesser availability of waste in quantity, than similar wastes from permanent installations. Liquid wastes from cookhouses will contain a high proportion of grease, food particles, soap, and other detergents. Shower/bath waste will be largely soapy water.

A-36. Laundry waste will contain detergents and may contain a large amount of particulate matter, depending on the operating environment. These wastes, because of chemical composition, soon clog the soil when discharged to the ground. Therefore, it is necessary to remove as much grease, particulate matter, and soap as possible from wastewater before it reaches the soil. Note that kitchen wastes normally have more grease and food debris and so the use of grease traps is critical.

A-37. Laundry and shower/bath water generates more volume so sufficient soakage pits/areas are essential. The soil conditions will determine whether soakage pits or trenches, evaporation beds, or drains are suitable for the disposal of liquid wastes.

A-38. (Figure A-22). The most practical method for the disposal of liquid wastes is the soakage pit. Constructed like a urine soakage pit, it normally

will dispose of liquid wastes for a total of 200 men. The difference between the construction of urine soakage pits and this soakage pit is that a grease trap is substituted for the pipes or troughs used in the urine soakage pit. If the camp is used for several weeks, two soakage pits should be constructed. Each pit is used on alternate days, since a rest period helps prevent clogging. A soakage pit that becomes clogged should be closed and a new one constructed.

- The top layer of earth, sacking, pebbles, straw, excelsior or grass can be replaced daily. This top layer is removed and burned or buried.
- The soakage pit can be provided with a removable cover.
- When a pit is to be closed, it is covered with a 600 mm (2 ft) layer of compacted earth and the site marked as described in Figure A-3.

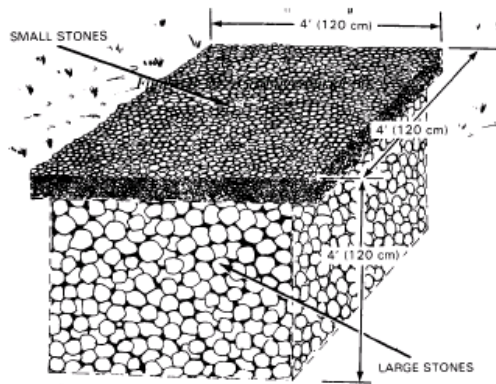


Figure A-22. Example Of A Soakage Pit

A-39. (Figure A-23). If the groundwater table or a rock formation exists close to the surface, a soakage trench may be used. This trench consists of a pit, 600 mm (2 ft) square and 300 mm (1 ft) deep, with a trench radiating outward from each of its corners for a distance of 1800 mm (6 ft) or more. Each trench is built 300 mm (1 ft) deep at the central pit to 450 mm (1.5 ft) deep at the outer ends of each trench. The pit and trenches are filled with material similar to that used in the soakage pits. Two such devices should be built for every 200 men; each device is used on alternate days. A grease trap is also used with a soakage trench.

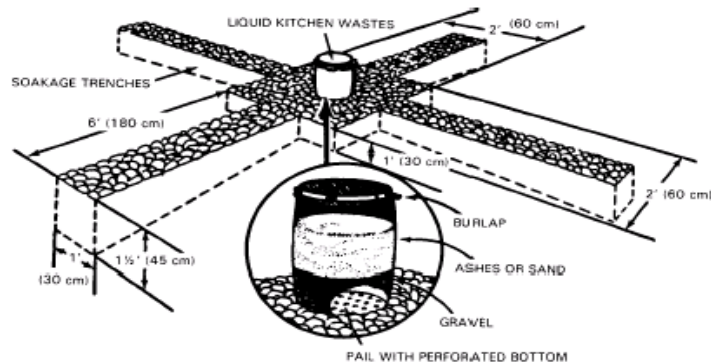
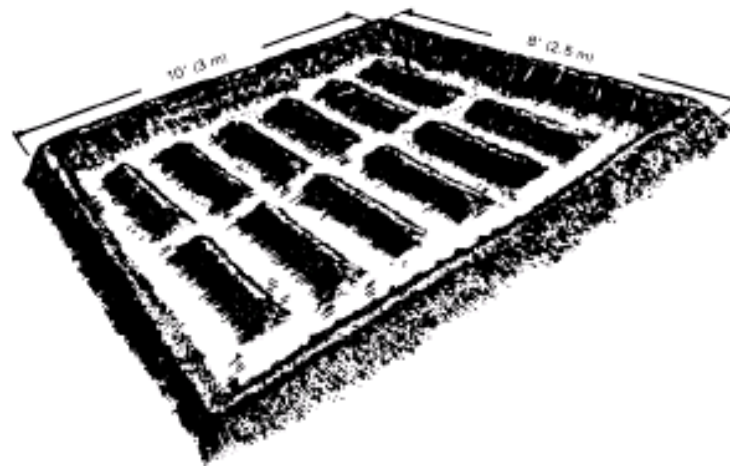


Figure A-23. An Example Of A Soakage Trench

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A-40. (Figures A-24 and A-25). In places where clay soil prevents the use of standard soakage pits, evaporation beds may be used if the climate is hot and dry.

- Sufficient beds, typically 2.4 meters by 3 meters (8 ft by 10 ft), are constructed to allow approximately 0.27 square meters (3 square feet) of surface area per person per day for kitchen waste and laundry waste and 0.18 square meters (2 square feet) per person per day for shower/bath wastes. The beds are spaced so that the wastes can be distributed to any one of the beds. In construction of a bed, the top soil is first scraped to the edges, thus forming a small dike around it; then the earth within the bed is spaded to a depth of 254 mm to 381 mm (10 inches to 15 inches) and raked into a series of rows, making the ridges approximately 150 mm (6 inches) above the depressions. These rows may be formed either lengthwise or crosswise as deemed desirable for the best distribution of water.
- In operation, one bed is flooded during the day with liquid waste to the top of the ridges, which is equivalent to an average depth of 75 mm (3 inches) over the bed; then the liquid waste is allowed to evaporate and percolate. After 3 or 4 days, this bed is usually sufficiently dry for re-spading and reforming. The other beds are flooded on successive days, and the sequence of events followed.
- Careful attention must be given to proper rotation, maintenance, and dosage of evaporation beds. It is also essential that kitchen wastes be run through an efficient grease trap before it is allowed to enter the evaporation beds. If these beds are operated properly, they create no insect hazard and only a slight odor. Other modifications of waste disposal methods are possible and should be used when they are more adaptable to a particular situation.



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Figure A-24. An Example Of An Evaporation Bed-1

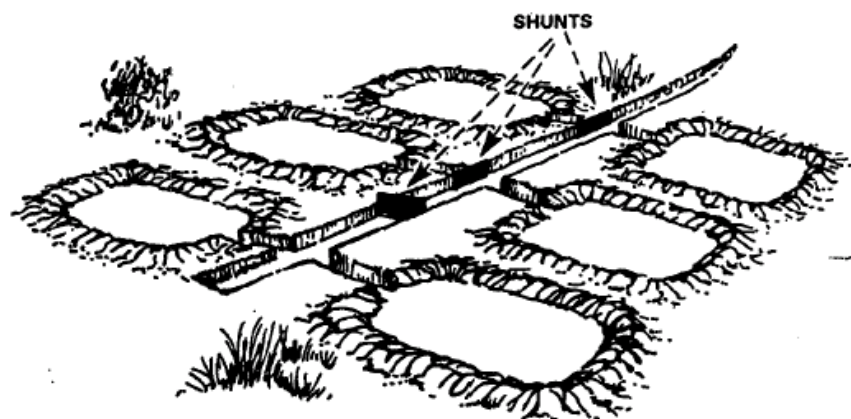


Figure A-25. An Example Of An Evaporation Bed-2

A-41. (Figure A-26). Herringbone drains are a modification of soakage trenches and can be used when soil conditions favor the percolation of wastewater. These are particularly effective in rocky soil where digging a soakage pit is prohibitive. The drains are constructed as described in the soakage trench, and the branch outward from central lines rather than from a central point. The drains can be filled with either the material prescribed for the soakage trench or spaded as with the evaporation beds. As with other types of liquid waste disposal devices, there should be a grease trap installed to prevent clogging of the drains. Re-spading of the drains may be required to ensure proper operation and care taken not to overload the drains.

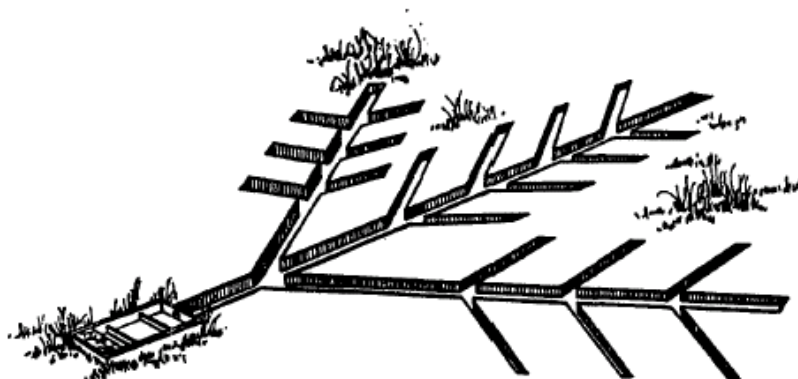


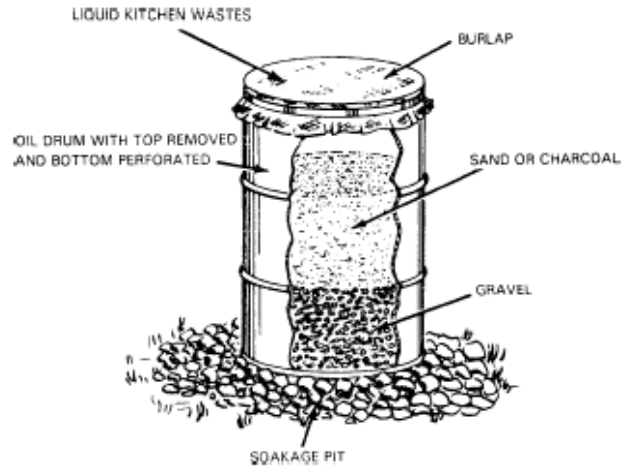
Figure A-26. An Example Of A Herringbone Drain.

A-42. Grease traps provide a means to separate grease from water and greatly enhance the operation of soakage pits, evaporation beds, and drains by preventing the soil from being clogged by grease and creating offensive odors and insect breeding grounds.

- *Barrel-type Baffle Grease Trap.* (Figure A-27). A barrel-type baffle grease trap may be made from a salvaged 55-gallon drum. Other materials used in construction of this device are pipe, screen, and scrap lumber. The bottom of the barrel is perforated and is then filled with gravel and then sand or

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charcoal. A screen is installed on the top of the barrel to capture food wastes and large particles to prevent the sand or charcoal layer from becoming clogged. As the wastewater is slowly poured in the top of the barrel, the grease is trapped at the top of the filter on the sand or charcoal and the grease-free water percolates down through the gravel and into the soakage pit. The particles on the screen and the grease remaining on the top can be skimmed off and disposed of by burying or burning.



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Figure A-27. Example Of A Barrel-Type Baffle Grease Trap

A-43. (Figures A-28 and A-29). A box-type baffle grease trap may be constructed from a salvaged wooden box or salvaged lumber. The baffle extends to within 25 mm (1 inch) of the bottom of the box and separates the grease and water. The greasy water is poured slowly into the large side of the box; the pressure of the liquid on this side forces the grease-free water under the baffle board and out of the pipe extending from the surface of the smaller section. The grease is skimmed off and disposed of by burying or burning.

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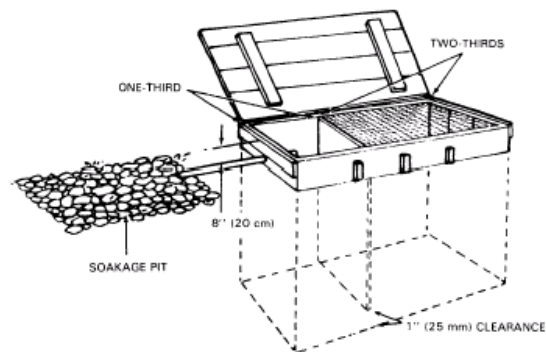


Figure A-28. An Example Of A Box-Type Baffle Grease Trap-1

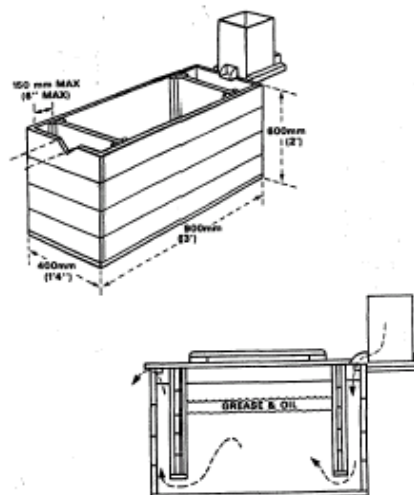


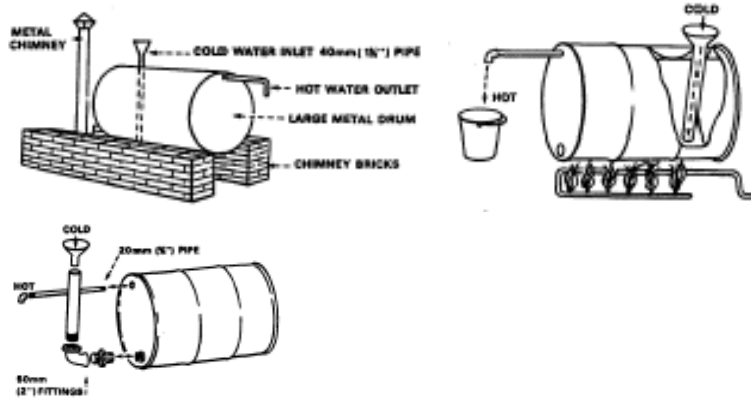
Figure A-29. An Example Of A Box-Type Baffle Grease Trap-2

A-44. Before greasy water is poured into a grease trap, it should be allowed to cool. Otherwise, the grease will remain uncongealed and will pass through the grease trap and reduce soil absorption of the wastewater.

- To ensure proper operation of a grease trap, it must be cleaned frequently. Grease must be removed, the trap drained, and the sediment in the bottom removed. If the grease trap is fitted with a straining device, the strainer must be cleaned daily with soap and water. The grease, sediment, and straining material (when no longer effective) are either burned or buried.
- Proper sizing of the grease trap is essential. If the grease trap is not equipped to handle the volume of water to be treated, the grease trap will overflow and malfunction causing grease to enter and clog the soakage pit and create insect breeding sites.
- Closed soakage pits, soakage trenches, evaporation beds, and herringbone drains should be marked with a contaminated site sign (Figures A-22) indicating “CLOSED SOAKAGE PIT,” “CLOSED SOAKAGE TRENCH,” “CLOSED EVAPORATION BED,” “CLOSED HERRINGBONE DRAIN,” or “CLOSED GREASE TRAP.”

A-45. The provision of hot water, even in limited quantities, is essential to the general health and well being of soldiers in the field. A supply of hot water for all purposes can be provided by the following methods:

A-46. (Figure A-30.) The put and take heater for hot water works on the displacement principle; cold water must be poured in to get hot water out. The user must have two containers, one empty, the other filled. The empty container is placed beneath the outlet spout. The cold water is then poured into the heater and the displaced hot water fills the empty container. When using this appliance, care must be exercised that it does not boil dry. Put and take heaters may be operated separately, or incorporated with incinerators.



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Figure A-30. An Example Of Put And Take Water Heaters

A-47. (Figure A-31). The instantaneous hot water heater is a simple and efficient hot water heater in the field. Cold water is poured into the perforated receptacle at one end, passes between two corrugated sheets of metal, and is collected in a receptacle at the other end via a small gutter. Any form of heating is placed under the corrugated sheets, for example wood fire or any other source material. The water is heated immediately. Turf may be placed over the upper corrugated sheet to give insulation. Instantaneous water heaters may be operated separately, or incorporated with incinerators.

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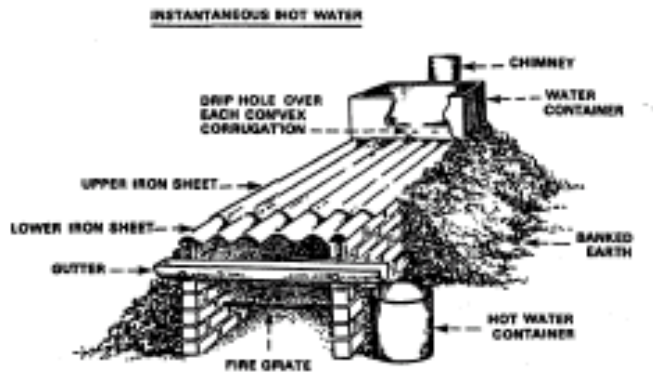


Figure A-31. An Example Of An Instantaneous Water Heater

A-49. (Figure A-32). This portable solar water heater can supply hot and cold water for the field kitchen or field showers. The advantages of the solar water heater are: it is an efficient method of hot water production in areas where fuel is scarce and weather conditions are right, and there is no pollution.

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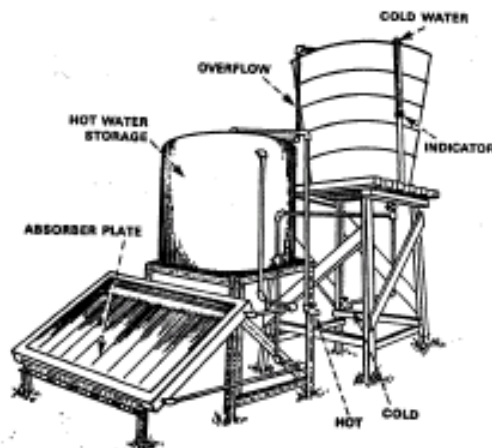


Figure A-32. An Example Of A Potable Solar Water Heater

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A-50. Unsanitary handling of food in the field has been responsible for many incidents of preventable disease. Food borne disease has the potential for causing entire units to become ill from a single unsanitary practice. The highest standards of sanitation must be maintained at all times. Kitchen personnel must ensure that food does not become contaminated with pathogenic organisms by:

- Using food that comes from approved sources only (food approved by the medical services).
- Preventing contamination during storage, preparation, and serving.
- Preventing the growth of organisms which cause food borne illnesses or spoilage.
- Preparing meals that are safe to eat and palatable.

A-51. Only use food from approved sources. The food must be protected from contamination during storage, preparation, and service. Keep cold foods below 4 ° C (40 ° F) and hot foods above 60 ° C (140 ° F) to prevent bacterial growth. Food should be served within three hours of preparation. Personal hygiene and sanitation are critical in food safety.

A-52. Food service worker should be inspected daily prior to starting work and should be clean and maintain good personal hygiene. Food service workers who are sick should not be allowed to handle, prepare, or serve food. Food service workers who have any open sores, open cuts, infections, skin irritations or rashes will not be allowed to handle, prepare, or serve food.

A-53. (Figure A-33.) Insulated food containers should be pre-heated (77° C/170° F) for hot food and pre-chilled (4° C/40° F) for cold food. When correctly prepared, insulated food containers can keep potentially hazardous foods at a safe temperature for up to four hours.

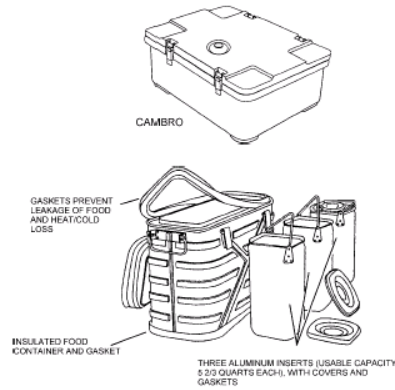


Figure A-33. Example Of Insulated Food Containers.

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A-54. Vehicles used for transporting food must be clean and completely enclosed. Vehicles used to transport garbage, trash, petroleum products, sort other materials by which food might become contaminated must be thoroughly cleaned with hot water and a detergent solution before transporting food. Never should food be transported simultaneously with trash, garbage, or soiled linen on the same vehicle. Each unit is responsible for providing clean tarpaulins, boxes, or bags for protecting food from exposure, handling, or contact with contaminated objects. Vehicles used for transporting bulk quantities of meat and dairy products over considerable distances must be refrigerated.

A-55. Proper food storage minimizes contamination and improves shelf life. Food will be stored in clean, covered containers that are impervious and nonabsorbent. Food will be stored above the floor/ground on clean racks, dollies, pallets, or other easily cleanable surface in such a manner to be protected from contamination and pests. These racks should be at least 150 mm (6 inches) above the floor. Raw food, such as meats, will not be stored over prepared food and should be physically separated to prevent cross-contamination. Foods requiring refrigeration will be maintained at below 4 ° C (40 ° F).

A-56. Personnel will thoroughly wash their hands and the exposed portions of their arms with soap and warm water before preparing food, after using latrine facilities, after using tobacco, between handling soiled surfaces (includes body parts and clothing) and clean utensils and equipment between handling raw and cooked foods, after performing custodial duties (including handling garbage or trash), and as often as necessary to keep their hands clean.

A-57. Ice must be made only from potable water. Freezing water does not purify it. Iced used must be made in facilities approved by the medical department prior to use. Ice must be protected from disease-producing organisms, debris, and trash. Washing the exterior of ice, which has become contaminated from improper handling or storage, does not make it sanitary; since ice is porous, disease-producing organisms can penetrate into the ice.

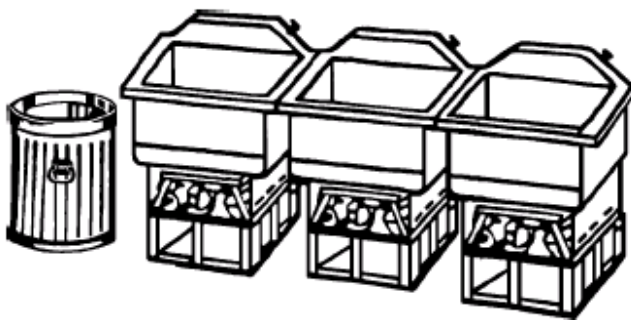
1 A-58. A field kitchen should be set up with the attitude that the kitchen will
2 be permanent. An attitude of “make do; we’re only here for a short time”
3 encourages poor sanitary standards.
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5 A-59. When selecting a field kitchen site, consider the following principles:

- 6 • The ground should slope gently to provide natural drainage.
- 7 • The site should have easy access for delivery of approved water and food
8 supplies.
- 9 • The site should be upwind from latrines.
- 10 • The site should be upstream from local villages and at sufficient distance
11 so their water supply is not affected.
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13 A-60. (Figure A-34.) Waste disposal and washing facilities for eating utensils
14 should be arranged within, or close to, the kitchen sanitation centers. Waste
15 disposal is thus easier and spillage is less likely to occur. When, for tactical
16 reasons, troops are required to move quickly through the serving area and
17 disperse, or when meals have been transported in insulated containers,
18 sanitation centers are decentralized. Rubbish must not be scattered over the
19 area and a strict standard of hygiene must be enforced to prevent food
20 poisoning. Utensil wash lines should be provided for every 80 soldiers
21 (approximately 1 liter of water per individual). Alternatively, wash waters
22 should be changed after 80 uses or following each meal. Utensil sanitation
23 centers must consist of the following:

- 24 • A garbage container for plate scraps.
- 25 • Hot (50-65° C/120-150° F) soapy water with brushes for cleaning utensils.
- 26 • Clear hot boiling water for rinsing; and,
- 27 • Clear hot boiling water for a second sanitizing rinse. This sanitizing rinse is
28 made using an approved food service disinfectant, a calcium hypochlorite
29 solution, or chlorine bleach solution to achieve a concentration of 100
30 milligrams chlorine per liter.
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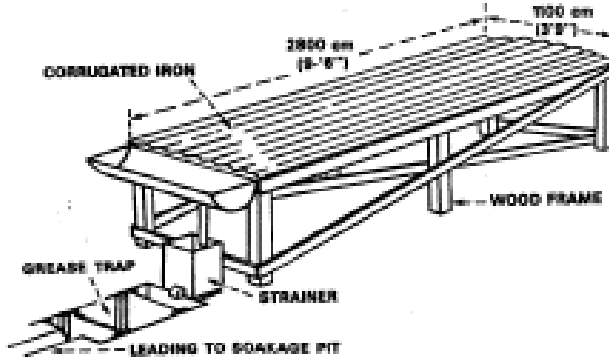
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33 Figure A-34. Example Of A Sanitation Center-1
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35 A-61. (See Figure A-35.) The kitchen wash-up areas, wash-up benches or
36 sanitation centers, should be situated on the lower side of the kitchen and
37 messing area and close to the water tank and water heating equipment, the
38 grease trap and waste disposal system, the garbage stand, and the kitchen
39 utensil storage rack.

- 40 • Overhead cover should be provided and the floor area should be covered
41 with sand or gravel. Tables, washing tubs, scrubbing brushes and soap or
42 detergent are required. Duckboards to stand on at the wash-up bench or
43 sanitation center are an advantage. Care must be taken to protect the

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ground by preventing spillage of wastewater, removal of food particles by raking, and renewal of the sand or gravel at regular intervals.



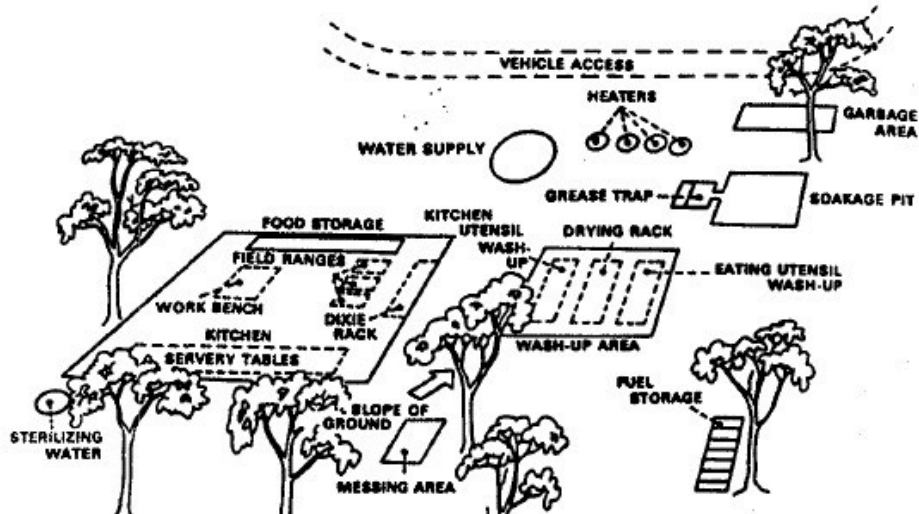
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Figure A-35. An Example Of A Wash-Up Bench

A-62. Liquid and solid waste disposal will follow the guidelines prescribed in this FM.

A-63. (See Figures A-36 and A-37.) Typical layouts of field kitchens, showing the relative positions of the site components, are provided below. As a general rule, the field kitchen should be located:

- 100 meters upwind from latrines;
- 30 meters from wash-up areas and sanitation centers;
- 30 meters upwind from waste disposal sites (grease traps, soakage pits, and garbage pits);
- 30 meters from natural water sources; and,
- 45 meters upwind from incinerators.



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Figure A-36. Example Of Field Kitchen Site Layout-1.

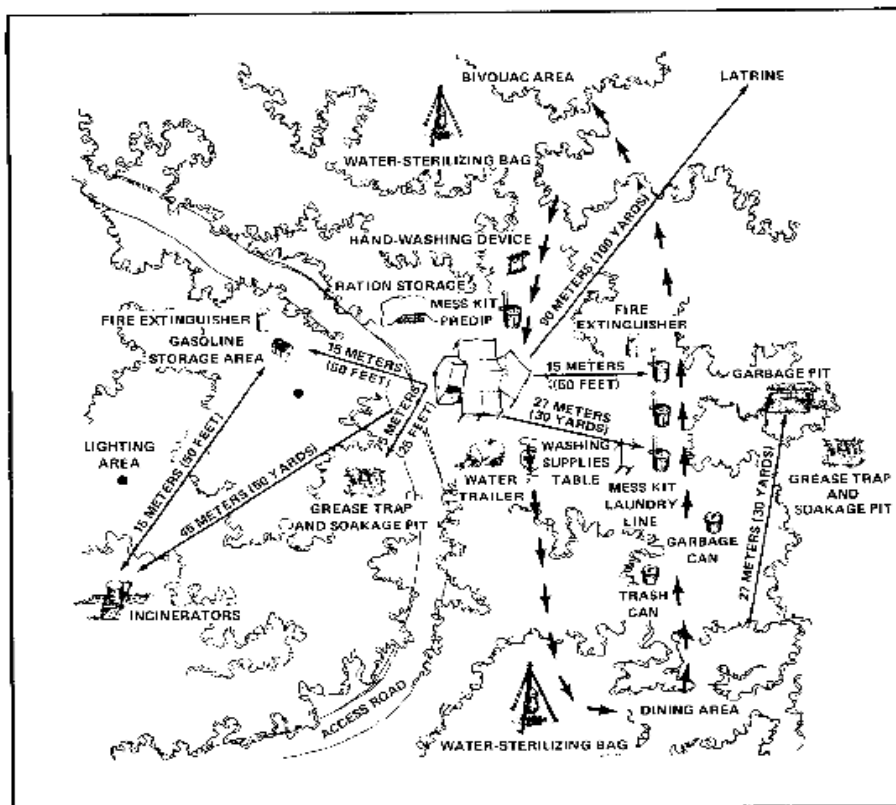


Figure A-37. An Example Of Field Kitchen Site Layout-2

A-64. Personal hygiene contributes to the effectiveness of the unit in several ways. It protects the individual from disease organisms in the environment. This protects the unit by reducing the spread of disease. Personal hygiene promotes the health of the unit's soldiers and improves their morale.

- *Personal Hygiene.* Regular use of soap and water prevents skin disease such as impetigo, boils, eczema, and heat rash. It blocks the fecal-oral spread of hepatitis, salmonellosis, and other gastrointestinal diseases. Daily washing of the body reduces the incidence of louse, tick, and flea infestations and controls related diseases such as typhus, relapsing fever, and plague. Proper daily dental care prevents gum infections and dental caries.

- *Prepare For The Field.* All soldiers need to bring toilet articles such as: soap, shampoo, washcloths, towels, toothbrush, dental floss, and fluoride toothpaste. To prevent the spreading of infections, do not share items. Male soldiers need a razor and blades. Female soldiers need sanitary napkins or tampons. All soldiers need talcum powder, cornstarch, and/or foot powder.

- *Remember, during a deployment, you may not be able to easily obtain these items and re-supply may not be available. Therefore, it is recommended that each soldier bring at least a ONE-month supply of these items.*

- *Hand-washing.* Frequent hand washing is the easiest and most effective personal protection against preventable diseases. Hands should be washed using soap and potable water after using the latrine, before eating, after eating, after handling any item that can potentially transfer germs (such as trash), and frequently during the day to keep hands free of germs.

- *Prevent Skin Infections.* Bathe frequently; take a full shower/bath at least once every week, if possible. If showers/baths are not available use a washcloth daily to wash: genital area, armpits, feet, and other areas where

1 you sweat or that become wet, such as between thighs or (for females) under
2 the breasts. Do not wear nylon or silk-type undergarments; cotton
3 undergarments are more absorbent and allow the skin to dry. Change to
4 clean clothing at the time of the full bath to aid in the control of lice.

- 5 • *Keep Skin Dry.* Daily use foot powder on your feet, especially if you have
6 had fungal infections on your feet in the past. Use talcum powder or
7 cornstarch in areas where wetness is a problem, such as: between the
8 thighs or (for females) under the breasts.
- 9 • *Prevent Dental Disease.* Tooth decay and gum infections can cause severe
10 illness if not prevented or treated early. Brush teeth and gums after
11 meals, or at least once a day. Use fluoride toothpaste; brush without it, if
12 toothpaste is not available. Use dental floss at least once a day. Rinse
13 your mouth with potable water after brushing and flossing; and,
14 frequently during the day when drinking water. Remember, consuming
15 sugary food and drink requires more frequent cleaning of teeth and gums.
- 16 • *Prevent Genital And Urinary Tract Infections.*

17
18 A-65. Males must wash the head of their penis when washing your genitals.
19 If uncircumcised, pull the foreskin back before washing. They should protect
20 themselves from sexually transmitted disease (STD). They should use a
21 condom--condoms help prevent STD transmission.

22
23 A-66. Females must wash your genital area daily. Don't use perfumed soaps
24 or feminine deodorants in the field--they cause irritation. They should protect
25 themselves from STD. They should insist that their sex partner use a
26 condom--condoms help prevent STD transmission. They should not douche
27 unless directed by medical personnel.

28
29 A-67. If properly worn, the uniform can be an effective means of protection.
30 The uniform should fit well, be properly maintained and be suitable for all
31 locally hazardous conditions such as extremes of climate, toxic chemicals, and
32 insect-borne diseases. For example, where there is a risk of being bitten by
33 insects, long trousers should be worn and sleeves should be kept rolled down.
34 Wear loose fitting uniforms; they allow for better ventilation. Tight fitting
35 uniforms reduce blood circulation and ventilation. Properly fitted shoes and
36 clean, regularly changed socks are essential to prevent serious foot problems
37 and infections.

38
39 A-68. Where necessary, personal protective devices should be provided to
40 soldiers to assist them in the prevention of disease. Instruction in proper use
41 is required as necessary. Items include such things as:

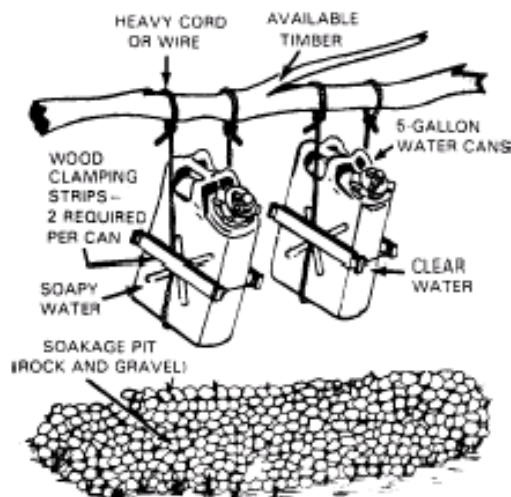
- 42 • Insect repellents, clothing impregnants, bed netting, aerosol insecticide,
43 and anti-malarial to protect against vector-borne diseases.
- 44 • Condoms to protect against sexually transmitted diseases.
- 45 • Hearing protection, such as earplugs, to protect against hearing loss.
- 46 • Personal protective equipment, such as gloves, masks, and clothing
47 suitable to protect against toxic industrial materials.

48
49 A-69. A final general health principle for individuals is avoidance. To be
50 effective, soldiers must be trained in the rationale and use of avoidance. A
51 general awareness of the potential disease hazards from local food, drinks,
52 plants, animals, sexually transmitted diseases, and inhabitants in many
53 foreign countries can decrease the incidence of preventable disease.

1
2
3 A-70. In the field, the devices necessary for maintaining personal hygiene
4 must be improvised. Some of the devices that have been tried and used
5 successfully in the field are described in this section. Potable water will be
6 used for hand-washing and personal hygiene.

7
8 A-71. (Refer to Figures A-38 and A-39.) Hand-washing devices that are easy
9 to operate must be provided at appropriate places such as outside latrines,
10 near the mess area, and at other locations as needed. A soakage pit must be
11 provided under each device to prevent water from collecting. The water
12 containers for these devices must be checked periodically, at a minimum
13 daily, to ensure that they are kept filled. Two of the most effective hand-
14 washing devices are described below.

15 • Two water cans, one filled with soapy water and one filled with clean
16 potable water, are suspended from an improvised frame as illustrated in
17 Figure A-38. A hole is punched into the cap to allow the water to run out
18 when the can is tipped or spigot is attached at the bottom of the can.



19
20 Figure A-38. An Example Of Hand-Washing Device-1
21

22 A-72. A clean food can, with four small holes punched in the bottom, is
23 attached to an improvised stand as illustrated in Figure A-39. In addition, a
24 20-liter (5 gallon) can of water, a dipper made from a small can, and a soap
25 dish made from a can with the edges turned down are needed. The water is
26 dipped from a large can and poured into the food can. The streams of water
27 from this can make it possible for a person to wash both hands at the same
28 time. Minimum amounts of water are required for this hand-washing
29 device. When this device is not in use, the can of water should be covered to
30 prevent contamination and mosquito breeding.
31

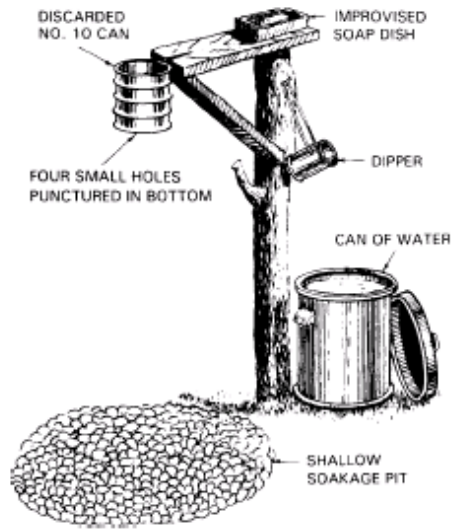


Figure A-39. An Example Of A Hand-Washing Device-2

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A-73. Whenever possible, shower devices should be provided in the field. They are important in maintaining not only the personal hygiene of the troops but also their morale. In some climates, heat from the sun will take the chill from the shower water. Furthermore, painting containers black or some other dark, dull color increases the absorption of heat from the sun. When the climate is such that a device is needed to heat the water, it may be improvised as discussed in paragraph A-74 and illustrated in figure 40, below. The shower devices described below are a few of the improvised devices that have been proven to be effective in the field. Each shower device should have a soakage pit built underneath it and wood duckboards positioned over the pit. Drums used to store petroleum products or hazardous chemicals should not be used as a source of materials for making showers.

A-74. (Figure A-40). A drum is converted into a suitable water container by removing the bottom and fitting the bung hole on the top with a control valve for the water outlet. This drum is then placed upside down on an overhead platform, and a perforated can is fastened over the water outlet.

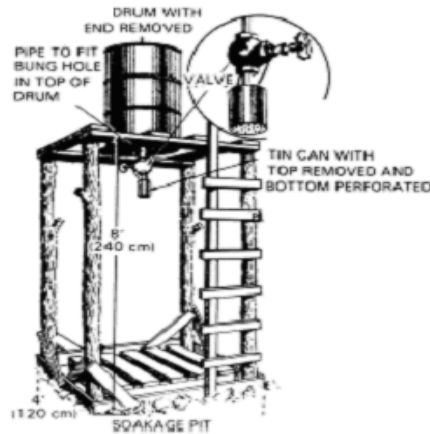


Figure A-40. An Example Of Inverted Drum Field Shower

23
24

1 A-75. (See Figure A-42.) This device is built by mounting a drum on an
 2 overhead frame in a way that permits it to tilt when a rope, attached to the
 3 top of the drum, is pulled. A safety strap, fastened to the frame, controls the
 4 extent to which the drum can be tilted downward. The bunghole portion of the
 5 top of the drum is removed, leaving approximately 2/3 of the top in place.
 6 Holes are punched in the upper part of the drum on the side opposite the
 7 open top; the tilt rope is attached to the top above these holes. A round rod is
 8 inserted crosswise through the drum and halfway between the top and
 9 bottom. The rod must project sufficiently on each side of the drum to remain
 10 securely in the notches that are cut into the overhead frame.
 11

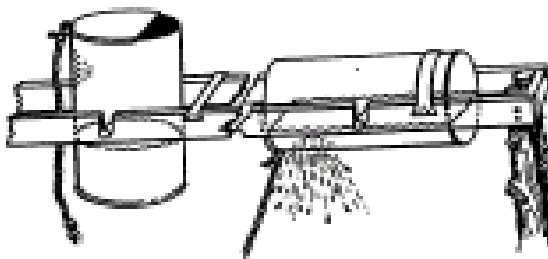


Figure A-41. An Example Of Mounted Tilt Drum Field Shower.

12 A-76. (See Figure A-42). When a water-heating device is required, two large
 13 drums are mounted on an overhead platform as described in the mounted
 14 inverted drum shower, paragraph (1) above. A burner is improvised and a
 15 small drum of water is placed on the burner. This burner drum is then
 16 connected to one of the overhead drums by means of two rubber tubes or
 17 metal pipes. One pipe is inserted into the overhead drum at approximately
 18 one-half its depth, whereas the other pipe is inserted near the bottom of the
 19 same drum. The other end of the pipe, which has been connected near the
 20 bottom of the overhead drum, should be inserted into the small drum to a
 21 point 50 mm to 75 mm (2 inches to 3 inches) from the bottom. As the water
 22 in the burner drum becomes hot, it rises up the higher pipe into the overhead
 23 drum. This water is replaced in the burner drum immediately by an equal
 24 amount of water leaving the overhead drum through the lower pipe. The
 25 second overhead drum is for provision of cold water for mixing at the shower
 26 outlet.
 27
 28
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 31

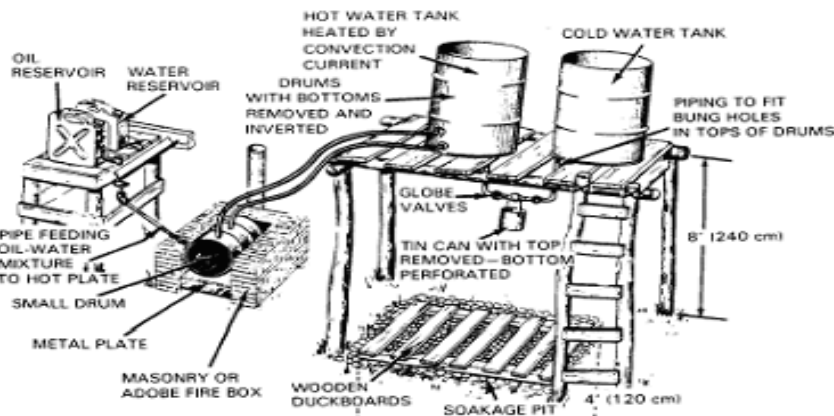
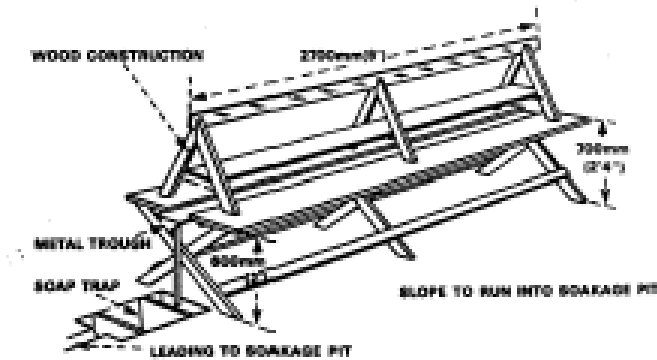


Figure A-42. An Example Of Field Shower With Water Heater

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A-77. (Figure A-43.) A simple form of ablution bench suitable for camp use can be constructed from salvaged materials. One double-sided bench 2700 mm (9 ft) in length will serve 50 soldiers. If dressed lumber is not available, this bench can be improvised from poles. A soakage pit must be provided and, for prolonged use, a small grease trap is desirable.



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Figure A-43. An Example Of Personal Washing Bench

- Collect and transport to approved disposal facilities.
- Expedient devices.
- Burial—Less than 1 week.
- Incineration—Longer than a week.
- Liquid kitchen or bathing waste disposal.
- Grease trap.
- Soakage pits.
- Evaporation beds.

Appendix B

PREVENTIVE MEDICINE SITE SURVEY CHECKLIST

The sample checklist on the next page is provided for an effective PVNTMED site survey within a field environment. It provides a guide that ensures all aspects of PVNTMED are included in the site survey. The checklist is for use by all PVNTMED personnel, the unit FLD SAN TM, or other persons conducting an evaluation of a unit's PVNTMED status.

Location: _____ Date(s): _____

Survey Team Members: _____

Site Population: _____

Expected future increase/decrease: _____

Male/Female: _____

1. Hygiene Devices

A. Showers NA SAT UNSAT
-Cleaned daily.
-Mold/mildew not present.
-Nonpotable water sign posted.

B. Handwash devices NA SAT UNSAT
-Outside latrines and mess hall.
-Stocked with soap and paper towels.
-Soakage pits.
-Warm water provided in cold climate.

C. Laundry facilities NA SAT UNSAT

2. Water

A. Adequate quantity NA SAT UNSAT
-Potable.
-Nonpotable.

B. Quality NA SAT UNSAT
-Meets TB MED 577 standards (for example, approved source, no coliforms, potassium hydrogen [pH] 5-9).
-Chlorine residual in showers.

C. Potable water used for cooking and beverages. NA SAT UNSAT

- 1 D. Bottled water stored out of direct sunlight. NA SAT UNSAT
2
3 E. Well water NA SAT UNSAT
4 -Sample analyzed by CHPPM.
5 -Wellhead completely covered.
6 -Restricted access to wellhead.
7
8 F. Reverse Osmosis Water Purification Unit NA SAT UNSAT
9 -(ROWPU) IAW DA Form 5456-R (from TB MED 577).
10
11 G. Potable water containers NA SAT UNSAT
12 -Clean and serviceable.
13
14 3. Food Service Sanitation
15 A. Transportation NA SAT UNSAT
16 -Vehicle clean and covered.
17 - Insulated food containers available/used.
18
19 B. Storage NA SAT UNSAT
20 -Area clean.
21 -Access restricted.
22 -Working thermometers present.
23 -Refrigerator at 40°F.
24 -Freezer at 0°F.
25 -Food stored above floor.
26 -Adequate space available for cold storage.
27
28 C. Only approved food and ice served to soldiers. NA SAT UNSAT
29
30 D. Preparation and serving NA SAT UNSAT
31 -Food properly thawed or cooked from frozen state.
32 -Protected from contamination during cooking
33 and serving.
34 (e.g., hygiene of food handlers, hair restraints,
35 use of serving detail, etc.).
36 -Proper time/temperature control for
37 PHF (<4 hours between 41-139°F).
38 -Adequate quantity/type of utensils.
39 -Raw fruits and vegetables washed/rinsed
40 with potable water prior to serving.
41
42 E. Sanitation center NA SAT UNSAT
43 -Three sinks used (wash-110°F, rinse-120°F,
44 sanitize-171°F or 100 ppm chlorine).
45 -Grease trap used on wastewater.
46
47 F. Proper management of leftovers NA SAT UNSAT
48
49 4. Wastewater Disposal NA SAT UNSAT
50 -Grey water from showers and kitchen.
51 -Soakage pit/trench or evaporation bed.
52
53 5. Human Waste Disposal

- 1 A. Latrines NA SAT UNSAT
 2 -Proper construction.
 3 -Adequate number (4% male, 6% female).
 4 -Properly maintained.
 5 -Stocked w/ toilet paper.
 6 -Located 100-yards downwind of mess hall.
 7 and 100 ft from ground water source.
 8

- 9 B. Urinals (mandatory if using burn-out latrines) NA SAT UNSAT
 10 -Pipe urinals with screened openings.
 11 -Trough urinals for more permanent settings.
 12 -Adequate soakage pit rotated monthly or closed when clogged.
 13

14 ****LIME IS NOT EFFECTIVE FOR FLY OR ODOR CONTROL AND SHOULD NOT BE USED!**

15
 16 6. Solid Waste Disposal

- 17 A. Garbage cans NA SAT UNSAT
 18 -Have lids and lined with plastic bags.
 19

- 20 B. Properly burned, buried, or hauled away NA SAT UNSAT
 21 -Burn area 50 yards downwind from camp.
 22 -Garbage buried 100 yards from any wells
 23 used as *drinking* water sources.
 24

- 25 C. Medical waste NA SAT UNSAT
 26 -Labeled.
 27 -Collected in closed, medical waste containers.
 28 -Segregated from regular trash.
 29 -Incinerated.
 30

- 31 D. Hazardous waste NA SAT UNSAT
 32 -Labeled.
 33 -Collected in closed containers (compatible with waste).
 34 -Transported properly.
 35 -Spill prevention provided (secondary containment).
 36

37 7. Arthropod Control

- 38 A. Screened billets and eating area NA SAT UNSAT
 39

- 40 B. Standing water eliminated or treated NA SAT UNSAT
 41

- 42 C. Tall grass eliminated or treated NA SAT UNSAT
 43

- 44 D. Uniforms treated NA SAT UNSAT
 45

- 46 E. Pesticides available and used properly NA SAT UNSAT
 47

- 48 F. N, n-diethy-meta-Tolumide (DEET) available NA SAT UNSAT
 49 and used

- 50 G. No history of arthropod diseases in troops NA SAT UNSAT
 51

52 8. Rodent Control
 53

- 1 A. No rodents trapped or sighted NA SAT UNSAT
- 2
- 3 B. Traps/rodenticides available and used properly NA SAT UNSAT
- 4
- 5 C. Harborage minimized NA SAT UNSAT
- 6 -Rubbish piles, piles of building materials.
- 7 D. Food sources minimized NA SAT UNSAT
- 8 -Food in sleep areas, open trash points, etc.
- 9

10 9. Environmental Injuries

- 11
- 12 A. Time allocated for acclimatization NA SAT UNSAT
- 13 -Altitude and temperature.
- 14
- 15 B. Heat CAT monitored NA SAT UNSAT
- 16
- 17 C. No history of heat/cold/altitude injuries NA SAT UNSAT
- 18
- 19 D. Sunscreen available/used NA SAT UNSAT
- 20

21 10. Chemical Hazards/Safety

- 22
- 23 A. Chemicals labeled and stored properly NA SAT UNSAT
- 24 -Motor pool, cleaning supplies, etc.
- 25
- 26 B. Enclosed areas ventilated when chemicals used NA SAT UNSAT
- 27
- 28 C. Personal Protective Equipment (PPE) and NA SAT UNSAT
- 29 - spill kits available and used fuel point.
- 30
- 31 D. Heaters NA SAT UNSAT
- 32 -Army approved.
- 33 -Minimum of 2 ft of clearance around heater.
- 34 -Exhaust vented to outside.
- 35 -Maintained properly.
- 36 -Firm, level, fireproof base (like metal tray with sand).
- 37 -Fire extinguisher present and properly charged.
- 38
- 39 E. No open flames within 50 ft of buildings/tents NA SAT UNSAT
- 40

41 11. Environmental Protection

- 42
- 43 A. No evidence of spills NA SAT UNSAT
- 44
- 45 B. Soldiers know what to do if spill occurs NA SAT UNSAT
- 46
- 47 C. Drip pans for vehicles, heaters, generators NA SAT UNSAT
- 48

49 12. Noise Hazards

- 50
- 51 A. Noise hazard areas clearly marked NA SAT UNSAT
- 52 -Generators.
- 53

- 1 B. Noise sources have baffling devices NA SAT UNSAT
- 2
- 3 C. Hearing protection used NA SAT UNSAT
- 4 -Ranges, mortar positions.
- 5
- 6 D. Living/work areas <85 db exposure to steady-state NA SAT UNSAT
- 7

8 13. Field Sanitation Team

- 9
- 10 A. Team trained and appointed. NA SAT UNSAT
- 11
- 12 B. Supplies available. NA SAT UNSAT
- 13
- 14 C. Team performing duties. NA SAT UNSAT
- 15

16 14. Stray Animals

- 17
- 18 A. Strays excluded from area. NA SAT UNSAT
- 19
- 20 B. If command chooses to allow animals, then NA SAT UNSAT
- 21 examined/vaccinated by vets.
- 22

23 15. Sleep Areas (recommend conducting walk through w/ NCO from unit or Chaplain)

- 24
- 25 A. Adequate floor space. NA SAT UNSAT
- 26 -minimum 40 sq ft/person, ideal-72 sq ft/person.
- 27
- 28 B. Personnel sleep head-to-toe. NA SAT UNSAT
- 29
- 30 C. Ventilation provided. NA SAT UNSAT
- 31 -if no mechanical ventilation, windows/doors
- 32 should be slightly open during sleeping.
- 33
- 34 D. Temperature control provided. NA SAT UNSAT
- 35
- 36 E. Adequate lighting. NA SAT UNSAT
- 37

38 16. Disease & Non-Battle Injury

- 39
- 40 A. Most common DNBI: 1. _____
- 41 2. _____
- 42 3. _____
- 43
- 44
- 45
- 46 B. Actions taken to address trends. NA SAT UNSAT
- 47
- 48 C. Personnel following prescribed anti-malarial regimen. NA SAT UNSAT
- 49
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17. Confinement Facility

- A. Adequate floor space. NA SAT UNSAT
-ideal 32 sq ft/person, but at least enough room
to lie down and stand.
- B. Ventilation provided. NA SAT UNSAT
- C. Temperature control provided. NA SAT UNSAT
- D. Hygiene and sanitation. NA SAT UNSAT
 - Access to latrine or container for human waste.
 - Shower at least once per week.
 - Handwash devices available.
 - Provided clean clothes and bedding when soiled
(consider treating with permethrin).
 - Floor washed routinely.
 - General sanitation of site—use of pest.
control measures.
- E. Nutrition. NA SAT UNSAT
 - Three meals a day.
 - Clean drinking water readily available.
- F. Personal Protective Equipment. NA SAT UNSAT
 - Disposable gloves and masks readily available
and used by guards.

NOTES:

Appendix C

Preventive Medicine Base Camp Assessment Checklist

SECTION I – ESTABLISHED BASE CAMP ASSESSMENT CHECKLIST

1. General Survey Considerations

- a. Name of Base Camp:
- b. Location of Base Camp (8 digit grid):
- c. Camp Medical Liaison POC Name and Telephone #:
- d. Date of Survey:
- e. Surveyor Name, Unit, Telephone #:
- f. Map/drawing of base camp attached (Yes/No):

2. Mission Considerations

- a. Number of personnel supported at this base camp:
- b. Expected duration of the mission:
- c. Military Operations being performed at the base camp:
- d. Support of Refugees/Displaced Persons Expected?
- e. Support of Enemy Prisoner of War (EPW) Expected?
- f. Support of Non-U.S. Forces Expected?

3. Base Camp Description

- a. Base camp acreage:
- b. Current use of site:
- c. Previous use of site:
- d. Current use of area surrounding site:
- e. Previous uses of area surrounding site:
- f. General direction of slope and percent (%) grade of site:
- g. Soil consistency:
- h. Are there areas of standing water in or around the base camp?
 - (1) Location (Indicate on site map):
 - (2) Depth:
 - (3) Area:
 - (4) Appearance (oily sheen, color, etc.):
 - (5) Odors:

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- i. Evidence of soil erosion:
 - (1) Location (Indicate on site map):
 - (2) Appearance:
 - (3) Probable cause:
- j. Excessive dust:
 - (1) Location (Indicate on site map):
 - (2) Color:
 - (3) Texture:
 - (4) Collect sample:
 - (5) Dust control measures used:
 - (6) Humidity:
- k. Excessive Vegetation:
 - (1) Trees:
 - (2) Shrubs:
 - (3) Tall grass:
- l. Local climatic conditions:
 - (1) Wind:
 - (2) Snow:
 - (3) Rain:
 - (4) Cold:
 - (5) Heat:
- m. Signs of past environmental pollution:
 - (1) Locations (Indicate on site map):
 - (2) Discolored soil:
 - (3) Discolored water/pools of liquid:
 - (4) Pools of unknown/unexplained liquid:
 - (5) Dead plants/Discolored vegetation:
 - (6) Dead animals/aquatic life:
 - (7) Unusual odor indicating chemical contamination (petroleum, and solvents: barrels/drums containing unknown substances:
- n. Signs of current environmental pollution:
 - (1) Locations (Indicate on site map):
 - (2) Drums/barrels on-site (location, numbers, condition):
 - (3) Chemical/Petroleum Containers:

- 1 (4) Polychlorinated biphenyls (PCB)s:
- 2 (5) Leaking containers/pipes:
- 3 (6) Discolored soil:
- 4 (7) Pools of unknown/unexplained liquid:
- 5 (8) Dead plants/Discolored vegetation:
- 6 (9) Dead animals:
- 7 (10) Unusual odor indicating chemical contamination (petroleum,
- 8 solvents, etc.)
- 9 o. Potential sources of environmental pollution:
- 10 (1) Industrial sites/Factories:
- 11 (2) Storage tanks located in area (Chlorine, acids, etc.):
- 12 (3) Agricultural activities (current use by host nation):
- 13 (4) Laboratories:
- 14

15 **4. Water**

- 16 a. Water source:
- 17 (1) Location (Indicate on site map):
- 18 (2) Type
- 19 (a) Surface (lake, pond, river, sea):
- 20 (b) Ground (dug well, bore-hole, artesian):
- 21 (c) Anthropogenic (fixed facility, bottled, bagged, HN supplied):
- 22 b. Evidence of surface water contamination:
- 23 (1) Scum:
- 24 (2) Foam:
- 25 (3) Excessive algae:
- 26 (4) Dead fish:
- 27 (5) Odors:
- 28 (6) Color:
- 29 (7) Sediment:
- 30 c. Developed groundwater source:
- 31 (1) Location (Indicate on site map):
- 32 (2) Type:
- 33 (3) Depth of groundwater:
- 34 (4) Well description (monitoring, potable, dry, irrigation, injection,
- 35 abandoned, etc.):
- 36 d. Soil, surface and ground water pollution sources within 2 miles:

- 1 (1) Landfills:
- 2 (2) Septic Tanks:
- 3 (3) Industry:
- 4 (4) Water/Wastewater Treatment Plants:
- 5 (5) Waste Storage Facilities:
- 6 (6) Agricultural activities:
- 7 e. Water distribution system:
- 8 (1) Type (fixed facility, tactical water distribution system (TWDS), public
- 9 water service (PWS)/DS, forward area water point supply systems
- 10 (FAWPSS), other):
- 11 (2) Capacity of system (gallons/day):
- 12 (3) Storage system/containers (gallons):
- 13 f. Water source approved by U.S. Preventive Medicine personnel?
- 14 (1) Approved by:
- 15 (2) Date approved:
- 16 (3) Date of last inspection:
- 17 g. Water monitoring records:
- 18 (1) Bacteriological (Attach bacteriological test sheet):
- 19 (2) Chemical (Attach chemical test sheet):
- 20 (3) Radiological:
- 21 h. Disinfection Techniques:
- 22

23 **5. Soil (Attach Sampling Results)**

- 24 a. Soil Sampling Survey conducted?
- 25 (1) Y/N:
- 26 (2) Date Conducted?
- 27 b. Soil Sampling survey coordinated?
- 28 c. Unit conducting survey samples?
- 29

30 **6. Air (Attach Sampling Results)**

- 31 a. Potential air pollution sources:
- 32 b. Air sampling survey conducted?
- 33 (1) Y/N:
- 34 (2) Date Conducted?
- 35 c. Air sampling survey coordinated?
- 36 d. Unit conducting survey samples?

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7. Sanitation

- a. Billeting:
 - (1) Quantity (space in square feet):
 - (2) Type:
- b. Wastewater disposal:
 - (1) Type:
 - (2) Adequacy:
- c. Solid waste disposal:
 - (1) Location (Indicate on site map):
 - (2) Type:
- d. Field Sanitation Teams:
 - (1) Training:
 - (2) Supplies:
 - (3) Utilization:
- e. Hazardous waste storage/disposal:
 - (1) Type of material/Generator:
 - (2) Location and type of storage container (Indicate on site map):
 - (3) Labeling:
 - (4) Secondary containment:
 - (5) Disposal method:
- f. Regulated medical waste storage/disposal:
 - (1) Type of material/Generator:
 - (2) Location and type of storage container (Indicate on site map):
 - (3) Labeling:
 - (4) Disposal method:
- g. Latrines:
 - (1) Location (Indicate on site map):
 - (2) Types:
 - (3) Quantity:
 - (4) Cleanliness:
 - (5) Frequency of evacuation/closure:
- h. Hand-washing Facilities:
 - (1) Location (Indicate on site map):
 - (2) Type:

- 1 (3) Quantity:
- 2 i. Shower Facilities:
- 3 (1) Location (Indicate on site map):
- 4 (2) Type:
- 5 (3) Quantity:
- 6 (4) Wastewater control method:
- 7

8 **8. Vector Control**

- 9 a. Feral Dog/Cat Control:
- 10 (1) Pets present:
- 11 (2) Bite reports/DNBI:
- 12 (3) Control measures:
- 13 b. Rodent Control:
- 14 (1) Present?
- 15 (2) Harborage areas?
- 16 (3) Food sources?
- 17 (4) Control measures:
- 18 c. Fly/Pest Control:
- 19 (1) Present?
- 20 (2) Control measures:
- 21 d. Mosquito/Tick Control
- 22 (1) Present?
- 23 (2) Breeding areas?
- 24 (3) Control measures:
- 25
- 26 e. Department of Defense (DOD) Repellent System
- 27 (1) DEET:
- 28 (2) Permethrin treated uniforms (include type of application method):
- 29 (3) Bed Nets:
- 30

31 **9. Food**

- 32 a. Dining facilities:
- 33 (1) Location (Indicate on site map):
- 34 (2) Type:
- 35 (3) Facilities inspected?
- 36 (4) Inspection reports available?

- 1 (5) Contract allows PVTMED to inspect facilities?
- 2 b. Food handlers:
- 3 (1) Training:
- 4 (2) Training records available:
- 5 (3) Health records for HN available:
- 6 c. Foods served in dining facilities:
- 7 (1) Food approved by Vets:
- 8 (2) Vet inspection forms available:
- 9 d. Food storage facilities:
- 10 (1) Type:
- 11 (2) Quantity:
- 12 (3) Adequacy:
- 13 e. HN eating establishments:
- 14 (1) Recommended list developed?
- 15 (2) List posted?
- 16 (3) Camp members following recommendations?
- 17 f. Kitchen waste disposal:
- 18 (1) Location (Indicate on site map):
- 19 (2) Method:
- 20 g. Food vulnerability study (how to protect food supplies from terrorist):
- 21 (1) Is one developed?
- 22 (2) Is copy available?
- 23 (3) Do food facility personnel understand contents and implications?
- 24

10. Diseases

- 26 a. Endemic/current infectious disease outbreaks in the local population:
- 27 b. Endemic/current infectious disease outbreaks in the base camp
- 28 population:
- 29 c. Compliance with special medical requirements for deploying personnel:
- 30 (1) Chemoprophylaxis:
- 31 (2) Immunizations:
- 32 d. Zoonotic diseases present:
- 33

11. Flora & Fauna

- 35 a. Venomous insects, spiders, reptiles:
- 36 (1) Any present/reported:

- 1 (2) Reported incidents/DNBI:
- 2 b. Poisonous plants:
- 3 (1) Any present/reported:
- 4 (2) Reported incidents/DNBI:

SECTION II – PREVENTIVE MEDICINE PRE-DEPLOYMENT BASE CAMP ASSESSMENT

1. Actions Prior to Pre-Site Survey

- a. Review information from Baseline Environmental Assessment from Annex L of the OPLAN:
- b. Contact AFMIC/USACHPPM to determine significant threats:

2. General Survey Considerations

- a. Name of proposed site:
- b. Location of proposed site (8-digit grid):
- c. Date of Survey:
- d. Surveyor Name, Unit, Telephone #:
- e. Map/drawing of proposed site attached (Y/N):

3. Mission Considerations

- a. Number of personnel expected to be supported at this proposed site:
- b. Expected duration of the mission:
- c. Military operations expected to be performed at the proposed site:

4. Proposed site Description

- a. Proposed site acreage:
- b. Current use of site:
- c. Previous use of site:
- d. Current use of area surrounding site:
- e. Previous uses of area surrounding site:
- f. Buildings on-site?
 - (1) What types;
 - (2) General description:
 - (3) Current use:
 - (4) Previous uses:

- 1 (5) Approximate age:
- 2
- 3 g. General topography of the proposed site and surrounding areas:
- 4 h. General direction of slope and % grade of site:
- 5 i. Soil characteristics:
- 6 j. Are there areas of standing water in or around the proposed site?
- 7 (1) Location:
- 8 (2) Depth:
- 9 (3) Area:
- 10 (4) Appearance (oily sheen, color, etc.):
- 11 k. Evidence of soil erosion:
- 12 (1) Location:
- 13 (2) Appearance:
- 14 (3) Cause:
- 15 l. Excessive dust:
- 16 (1) Location:
- 17 (2) Color:
- 18 (3) Texture:
- 19 (4) Collect sample:
- 20 m. Excessive Vegetation:
- 21 (1) Trees:
- 22 (2) Shrubs:
- 23 (3) Tall grass:
- 24 n. Local climatic conditions:
- 25 (1) Wind:
- 26 (2) Snow:
- 27 (3) Rain:
- 28 (4) Cold:
- 29 (5) Heat:
- 30 o. Signs of past environmental pollution:
- 31 (1) Discolored soil:
- 32 (2) Discolored water
- 33 (3) Pools of unknown/unexplained liquid:
- 34 (4) Dead plants/Discolored vegetation:
- 35 (5) Dead animals/aquatic life:
- 36 p. Signs of current environmental pollution:

- 1 (1) Drums:
- 2 (2) Chemical/Petroleum Containers:
- 3 (3) Polychlorinated biphenyls :
- 4 (4) Leaking containers/pipes:
- 5 (5) Discolored soil:
- 6 (6) Pools of unknown/unexplained liquid:
- 7 (7) Dead plants/Discolored vegetation:
- 8 (8) Dead animals:
- 9 q. Potential sources of environmental pollution:
- 10 (1) Industrial sites/Factories:
- 11 (2) Agricultural activities:
- 12 (3) Laboratories:
- 13

14 **5. Water (Attach Sampling Results)**

- 15 a. Water source:
- 16 (1) Location:
- 17 (2) Type (surface, ground, HN supplied):
- 18 b. Evidence of surface water contamination:
- 19 (1) Scum:
- 20 (2) Foam:
- 21 (3) Excessive algae:
- 22 (4) Dead fish:
- 23 (5) Odors:
- 24 (6) Color:
- 25 c. Developed groundwater source:
- 26 (1) Location:
- 27 (2) Type:
- 28 (3) Depth of groundwater:
- 29 d. Soil, surface and ground water pollution sources within 2 miles:
- 30 (1) Landfills:
- 31 (2) Septic Tanks:
- 32 (3) Industry:
- 33 (4) Water/Wastewater Treatment Plants:
- 34 (5) Waste Storage Facilities:
- 35 (6) Agricultural activities:
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6. Waste

- a. Describe sewage disposal systems:
 - (1) Type:
 - (2) General condition:
 - (3) Approximate age:
- b. Describe solid waste disposal facilities:
 - (1) Type:
 - (2) General condition:
 - (3) Approximate age:

7. Soil (Attach Sampling Results)

- a. Soil Sampling Survey conducted?
 - (1) Y/N:
 - (2) Date Conducted?
 - (3) Who conducted (US, HN, other):
- b. Soil Sampling plan developed?
- c. Soil sampling plan coordinated?
- d. Unit conducting soil sampling?

8. Air (Attach Sampling Results)

- a. Prevailing wind direction:
- b. Daily temperature range (highs & lows):
- c. Noticeable odors:
- d. Particulate presence:
- e. Major potential air pollution sources:
- f. Chemical reconnaissance (FOX):
- g. Air sampling survey conducted?
 - (1) Y/N:
 - (2) Date Conducted?
 - (3) Who conducted (US, HN, other):
- h. Air sampling plan developed?
- i. Air sampling plan coordinated?
- j. Unit conducting air sampling?

9. Vector Control

- a. Feral Dog/Cat present?

- 1 b. Rodents:
- 2 (1) Present?
- 3 (2) Harborage areas?
- 4 (3) Food sources?
- 5 c. Mosquitoes:
- 6 (1) Present?
- 7 (2) Breeding areas?
- 8 d. Ticks present?
- 9

10 **10. Diseases**

- 11 a. Endemic/current infectious disease outbreaks in the local population:
- 12 b. Zoonotic diseases present in the local community:
- 13

14 **11. Flora & Fauna**

- 15 a. Venomous insects, spiders, reptiles:
- 16 b. Poisonous plants:
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- 28 d. Other applicable environmental laws, regulations, OPORD, and unit SOP.
- 29 e. Site specific environmental business solutions (EBS) (if applicable).
- 30

31 **1. Site/Incident Location:**

- 32 a. Legal address:
- 33 b. Location:
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35 **2. Site/Incident Description:**

- 36 a. Primary functions at site:
- 37 b. History of the site:

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- c. Date/Time of incident:
- d. Type of incident:
- e. Circumstances of incident:

3. Map/Description of the Incident Location:

- a. Accurate enough to direct a follow-on element to the site:
- b. Cross reference with previous EBS (if available):

4. Summary of Environmental Conditions:

- a. List environmental events at the site/location:
- b. Include quantities and clean-up activities

5. Interior and Exterior Considerations:

- a. Abbreviated version of information found in EBS:
- b. Only address issues if they differ from last environmental consideration reports (ECR) or initial EBS:

3. Findings and Determinations with Qualifications Statement:

Statement similar to:

“According to _____ Reg _____, I have considered whether or not significant environmental impacts will occur as a result of turnover/ return of this site (base camp, logistics area) and have determined that (include one of the following statements):”

- a. Turnover of this base camp area will not result in environmental impacts significant enough to warrant additional environmental analysis.

OR

- b. Turnover of this base camp area will result in environmental impacts significant enough to warrant additional environmental analysis. Environmental actions or projects must continue after transfer of the base camp area because of substantial (imminent) threat to human health or safety. The impacts of concern are (list impacts).

(If the report is due to an incident not concerned to a specific site/installation, this paragraph is an assessment by the commander/individual on the scene.)

Base Camp Mayor

APPENDIX D

SAMPLE UNIT FIELD SANITATION
STANDING OPERATING PROCEDURES

The following brief outline checklist will assist in developing SOP satisfactorily shows positive actions and specific duties considered suitable for a company-sized unit. When completed, the SOP is a very "detailed cookbook" of how to complete a designated task, step-by-step. Standard operating procedures take a considerable amount of time to develop; they are very detail oriented. The following format, actions, time frames, and techniques are shown as examples only and are not intended to apply in all cases or to all units. For most units, the scope, actions, quantities, and responsibilities need to be adapted to the local commander's requirements throughout all stages of an operation, from predeployment, deployments, site selection, set-up, maintenance, and recovery and redeployment.

1. **References.**

- Army Regulation 40-5, Preventive Medicine.
- Field Manual 4-02.17, Preventive Medicine Services.

2. **Purpose.** To reduce DNBI by ensuring that effective PMM are routinely and habitually practiced under all field conditions.

3. **Scope.** This SOP specifies for all field exercises and contingencies--

- a. The required FST supplies and equipment.
- b. The routine, special, and emergency PMM to be taken.
- c. The responsibilities for the accomplishment of PMM.

4. **Field Sanitation Team.** The FLD SANTM is appointed by the commander as his special representatives to oversee and observe PPM before, during, and after field exercises or contingencies. Because of special training, they know and are authorized to initiate the necessary PPM to reduce DNBI to the lowest possible level. The PMM that will always be accomplished by the designated individual(s) identified below.

5. **Key.** The individual(s) with the requirement for performing the indicated PMM task is identified in the ACTION column. The SUPERVISE/FOLLOW-UP column identifies the leader/noncommissioned officer responsible. The individuals are keyed as follows:

AP--Advance Party Leader	ME--The Company Trauma Specialist
CD--Commander	SS--Supply Sergeant
DF--Dining Facility Sergeant	UL--All Officers/Noncommissioned Officers
DL--Assigned Detail	IC--First Cook
FS--Field Sanitation Team	IS--First Sergeant
KP--Kitchen Police	

6. **Actions and Responsibilities.**

ACTION

SUPERVISE/

FOLLOWUP

a. Planning and Preparations.

- | | | |
|---|----|----|
| 1. Provide personal PPM instruction to troops. | FS | IS |
| 2. Check supplies, equipment, and loading. | FS | IS |
| 3. Water/water trailer: | | |
| (a) Clean/fill/chlorinate/test (5 ppm). | ME | DF |
| (b) Locate QM water point(s). | SS | FS |
| (c) Determine quantity needed. | FS | IS |
| 4. If potentially hazardous food— | | |
| (a) Get ice chest(s)/container(s). | DF | IS |
| (b) Locate ice point(s). | SS | FS |
| (c) Take food temperatures. | FS | IS |
| (d) Determine where frozen food will be
Tempered. | FS | IS |
| 5. Rubbish/garbage. | | |
| (a) Provide for containers. | SS | FS |
| (b) Locate disposal point(s). | SS | FS |
| 6. Assure sufficient insect-/rodent-proof food
Containers. | IC | DF |
| 7. Plan and train for contingencies in— | | |
| (a) Hot temperatures. | IS | CD |
| (b) Cold temperatures. | IS | CD |

b. Arrival at Field Site.

- | | | |
|---|----|----|
| 1. Spot/set up dining facility and latrine. | AP | FS |
| 2. Setup chemical toilets/urinals (1 to 14 days). | DL | FS |
| 3. Dig deep pit (7 plus days). | DL | FS |
| 4. Dig soakage pit (liquid kitchen waste). | DL | DF |
| 5. Spot/set up rubbish/garbage collection points
(If no burial). | DL | FS |
| 6. Spot/set up water purification bag. | IS | FS |
| 7. Spot/set up handwashing devices (at dining
facility and latrine). | ME | FS |

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c. Routine Actions.

1. Set up/boil water in mess kit laundry. DF FS
2. Test chlorine residual daily. FS ME
3. Chlorinate/disinfect if test fails. FS ME
4. Schedule/remove garbage/rubbish (every 2 days). SS IS
5. Inspect for/destroy fly/mosquito breeding places. FS IS
6. Police food/drink spills to prevent fly-breeding and rodent infestations. UL FS
7. Inspect mess kit cleaning. UL FS
8. Inspect utensils/ranges/tables/containers after cleanup following meals. DF FS
9. Observe/inspect personal hygiene of troops. UL IS
10. Police latrine daily; control flies as required. DL FS

d. Special Conditions/Actions.

1. Foot marches.
 - (a) Prior to. UL IS
 - (b) During and after. UL IS
2. Cold temperature (below 50° F/10°C).
 - (a) Provide for exercise (such as frequent road halts). UL IS
 - (b) Instruct on wear/drying of clothing/footwear. UL IS
 - (c) Instruct on prevention of trench foot, immersion foot, frostbite, snow blindness, and carbon monoxide poisoning. ME FS
 - (d) Provide for and heat latrine. DL FS
 - (e) Inspect feet/footwear of troops. UL IS
3. Hot temperature (WBGT index over 85).
 - (a) Obtain WBGT as directed. ME FS
 - (b) Schedule work for acclimatization. IS CD
 - (c) Provide adequate water. FS IS
 - (d) Instruct troops on cause and prevention

e. Emergency Conditions/Actions.

1. Loss of bath/laundry support.
 - (a) Intensify personal hygiene inspections/observations. UL IS
 - (b) Provide expedient shower/laundry devices. DL FS
 - (c) Inspect troops for body lice 3 weeks after loss of support in cold weather. (Notify medical personnel if body lice are found.) FS ME

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5	2. Loss of water-heating capability.		
6	(a) Start use of disinfectant for mess kit		
7	laundries and utensils.	DF	FS
8	of heat exhaustion, heatstroke,		
9	heat cramps, sunburn, prickly heat,		
10	and fungus infections	ME	UL
11			
12	(b) Provide/improvise expedient		
13	water-heating device(s).	DL	FS
14	(c) Intensify personal hygiene		
15	inspections/observations.	UL	IS
16			
17	f. Departure and Return from Field Site.		
18			
19	1. Close latrines, soakage pits.	UL	IS
20	2. Clean, repair, reorder, replace, and store		
21	equipment/supplies as required.	UL	IS
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Glossary

ABCA	American, British, Canadian and Australian
AFMIC	Armed Forces Medical Intelligence Center
AMEDD	Army Medical Department
AMEDDCS	Army Medical Department Center and School
AML	area medical laboratory
AO	area of operations
AR	Army Regulation
AP	advance party leader
Attn	attention
BAS	battalion aid station
BDO	Battledress Overgarment
BT	basic training
BTL	bottle
BX	Box
C	centigrade/Celsius
CBRN	chemical, biological, radiological, nuclear
CEP	communication earplug
CEPS	Communication enhancement Protection System
CD	commander
CHPPM	Center for Health Promotion and Preventive Medicine
cm	centimeter
CN	can
CO	commanding officer
CONUS	Continental US
COSR	combat operational stress reactions
CVC	combat vehicle crewman coverall
DA	Department of the Army
dB(A)	decibels (weighted scale)

1	dB(P)	decibels (pressure)
2	DEET	75 percent N, N-diethyl-M-Toluamide
3	DF	dinning facility sergeant
4	DL	assigned detail
5	DNBI	disease and nonbattle injury
6	DBDU	Desert Battle Dress Uniform
7	DGSCR	Defense Government Supply Center, Richmond
8	DIV	Division
9	DOD	Department of Defense
10	DOT	Department of Transportation
11	DS	direct support
12	DZ	dozen
13	EA	each
14	EBS	environment business solutions
15	EC	emulsifiable concentrate
16	ECR	environmental consideration reports
17	EPW	enemy prisoner of war
18	ESOC	Emergency Supply Operations Center
19	F	Fahrenheit
20	FAWPSS	forward area water point supply systems
21	FLD SAN TM	field sanitation team
22	FM	field manual
23	FORSCOM	Forces Command
24	FS	field sanitation team
25	ft	feet/foot
26	g	grams
27	GA	gauge
28	Gal	gallon
29	GTA	graphic training aid
30	H	heavy work intensity
31	HN	host nation
32	HPF	Hydro Pack Filtration
33	Hr	hour
34	HSS	health service support
35	HTH	calcium hypochlorite, 70 percent available
36		chlorine
37		

1	IC	first cook
2	IDA	individual dynamic absorption kit
3	IND	individual
4	IS	first sergeant
5	KT	kit
6	KP	kitchen police
7	L	light work intensity
8	Lb	pound
9	LIN	line item number
10	LP	listening post
11	M	moderate work intensity
12	MCRP	Marine Corps Reference Publication
13	ME	the company trauma specialist
14	MED	medical
15	MEDSURV	medical surveillance
16	Mg/L	milligrams/Milliliter
17	MI	milliliter
18	Min	minute
19	MKT	mobile field kitchen
20	MOPP	mission-oriented protective posture
21	Mph	miles per hour
22	MRE	meal(s), ready to eat
23	MTF	medical treatment facility
24	M-TOE	Modification Table of Organization and Equipment
25		
26	MSDS	material safety data sheets
27	NATO	North Atlantic Treaty Organization
28	NA	not applicable
29	NBC	nuclear, biological, and chemical
30	NIPRNET	Nonsecure Internet Protocol Router Network
31	NL	no limit (continuous work possible)
32	NSN	National Stock Number
33	OEH	occupational and environmental health
34	OIF	Operation Iraqi Freedom
35	OP	observation post
36	PCB	polychlorinated biphenyls
37	%	percent(age)
38	PG	package
39	pH	potassium hydrogen
40	PHF	potentially hazardous foods
41		
42		

1	pH	potassium/hydrogen
2	PM	preventive medicine
3	PMM	preventive medicine measures
4	POC	point of contact
5	POL	petroleum, oil, and lubricants
6	psi	pounds per square inch
7	PVNTMED	preventive medicine
8	PWS	public water service
9	QSTAG	Quadripartite Standardization Agreement
10	Qt	quart
11	Rh	Relative Humidity
12	SAT	satisfactory
13	SEP	Soldier Enhancement Program
14	SIPRNET	Secret Internet Protocol Router Network
15	SME	subject matter expert
16	SOP	standing operating procedures
17	SPF	sun protection factor
18	sq	square
19	SS	Supply sergeant
20	STANAG	Standardization Agreement
21	STD	sexually transmitted disease
22	SWA	Southwest Asia
23	TABS	tablets
24	TAML	theater Army medical laboratory
25	TB	technical bulletin
26	TIM	toxic industrial chemicals/materials
27	TO	theater operations
28	TOE	tables of organization and equipment
29	TTP	tactics, techniques and procedures
30	TWDS	tactical water distribution system
31	U/I	unit of issue
32	UL	all officers/noncommissioned officers
33	USR	unit status report
34	US	United States
35	USACHPPM	US Army Center for Health Promotion and Preventive Medicine
36		
37	USARIEM	United States Army Research Institute of Environmental Medicine
38		
39		
40		

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UNSAT	unsatisfactory
VL	very light
UV	ultraviolet
WBGT	wet bulb globe temperature
Y/N	yes/no

Index

- A**
- animals,
 - birds,
 - domestic,
 - wild
 - Armed
 - Forces Medical Intelligence Center,
 - area medical laboratory,
 - area of operations,
 - advance party leader,
 - arthropods,
 - spiders,
 - scorpions,
 - centipedes,
 - bees,
 - fleas,
 - lice,
 - mosquitoes,
 - ticks,
 - wasps,
 - attention
- B**
- Battledress Overgarment,
- C**
- calcium hypochlorite,
 - centigrade/Celsius,
 - chemical
 - biological,
 - resistant gloves,
 - radiological,
 - nuclear,
 - chlorination kit,
 - cold injuries
 - freezing
 - frostbite,
 - non-freezing
 - chilblains,
 - trench foot,
 - immersion foot,
 - wet/damp clothing
 - communication earplug,
 - communication,
 - enhancement Protection System,
 - commander,
 - counter terrorism
 - centimeter,
 - Continental US,
 - combat operational stress reactions,
 - combat vehicle crewman,
 - coverall,
- D**
- Department of the Army,
 - decibels (weighted scale),
 - dB(P) decibels (pressure),
 - 75 percent N, N-diethyl-M-Toluamide,
 - dinning facility sergeant,
 - assigned detail,
 - disease and nonbattle injury,
 - Desert Battle Dress Uniform,
 - Defense Government Supply Center Richmond,
 - Division,
 - Department of Defense,
 - Department of Transportation,
 - drug interdiction
- E**
- ear
 - plug(s),
 - carrying case,
 - Communication Enhancement Protective System,
 - foam,
 - triple flange,
 - when to wear,
 - noise muffs,
 - seating device
- environment(al)
- business solutions,
 - health hazards
 - hot and cold injuries
- emulsifiable concentrate,
 - environmental consideration reports,
 - enemy prisoner of war,
 - Emergency Supply, Operations Center,
- F**
- Fahrenheit,
 - food
 - hot,
 - cold,
 - containers,
 - mess kits,
 - service operations,
 - potentially hazardous,
 - forward area water point supply systems,
 - field
 - sanitation team, manual,
 - drum showers
 - Forces Command,
 - fluids, non-alcoholic
 - field sanitation
 - standing operating procedures,
 - team equipment and materials
- G**
- graphic training aid
- H**
- handwashing device,
 - hazardous
 - noise,
 - heavy work intensity,
 - host nation,
 - humanitarian,
 - Hydro Pack Filtration,
 - health service support,
 - calcium hypochlorite, 70 percent available chlorine,
- I**
- individual dynamic
 - absorption,
 - insect(s)
 - biting,
 - control,
 - Department of Defense repellents, DEET,
 - individual dynamic
 - absorption kit,
 - pesticides,
 - underwear and cap,
 - spray can,

J	occupational and environmental health, Operation Iraqi Freedom, observation post,	with vapor burner,
K	P	Soldier Enhancement
kitchen police	peacekeeping, pesticides, pets, personal hygiene, physical	Program, snake(s), venomous bites,
L	fitness, mental, petroleum, oil, and lubricants, prevent dental disease genital infections urinary tract infections preventive	standing operating procedures Standardization
latrines	preventive medicine measures, poisonous plants polychlorinated biphenyls potentially hazardous foods potassium/hydrogen pounds per square inch preventive medicine, measures, public water service	Agreements, sun
cat-hole,		glasses, wraparound,
shallow trench,		protection factor, sexually transmitted
deep trench,		disease, Southwest Asia,
bored-hole,		T
mound,		tactical water distribution system,
pail,		technical bulletin, theater Army medical
burnout,		laboratory, toxic industrial
portable chemical,		chemicals materials, biological, exhausts,
levels of care		detergents, gases
light work intensity,		carbon monoxide, medical
line item number,		waste sewage, theater operations,
liquid waste		U
barrel-baffle type,		ultraviolet radiation, surrounded by snow
box-baffle type,		unit status report, unit of issue,
evaporation bed,		urinals
herringbone drain,		soakage pit, trough,
soakage pit,		oil, shallow trench,
soakage trench,		US Army Center for Health Promotion and Preventive
listening post,		Medicine, United States Army,
M	Q Quadripartite Standardization Agreements,	Research Institute of Environmental Medicine, urine
moderate work intensity,		darkly colored, stream
Marine Corps Reference Publication	R	
the company trauma specialist,	Relative Humidity	
medical,		
medical surveillance,	S	
milligrams/Milliliter,	salt in meals, tablets, Secret Internet Protocol Router Network,	
mobile field kitchen,		
mission-oriented protective posture,	site survey checklist, sleep,	
meal(s), ready to eat,	solid refuse food waste, dry waste, hazardous waste, garbage pits	
material safety data sheets,		
nuclear, biological, and chemical,	incinerators barrel, graduated, inclined plane,	
N		
non-caffeinated fluids		
Nonsecure Internet Protocol Router Network,		
National Stock Number,		
O		

W

water
 requirements,
 boiling,
 bulk source water supply,
 chlorine
 residual,
 test
 strips,
 tablets,
 color comparator,
 containers,
 inspections of,
 collapsible fabric drums,
 onion tanks
emergency water
 treatment kit,
 heat injury,
heaters
 put and take,
 instantaneous,
 portable solar,
household bleach
iodine tablets
forward osmosis water
 filtration systems,
waste disposal problems
 and solutions,
wet bulb globe temperature,

yes/no